Manor House Kirton



Build A Sustainable Home That Won't Cost The Earth To Run!

Eco build your future

We had so much interest in our Award Winning house at Kirton that I produced this brochure of how and what we used for our echo build house.

We went to all the shows, waded through piles of brochures to find the right product for us and our build…….It is a mine field out there!, We felt there was a gap in the market to help and share our knowledge to people who want to build a sustainable home like ours.

We are completely impartial, we have not received any commissions from the products that we have used in our build, so we are not bias to any particular product or design, just inspired by what has worked for us in our multi award winning home.





Passive House

What is a Passive House?

A Passive House is a building standard, that exceeds the present building regulations by far. Built according to this high standard the need for heating is reduced by 90%. Compared to a conventional build, which has an average heating demand of 150kWh/m2a, compared to a passive home only needs 15kWh/m2a.

Because of the effective super insulation, heat stays within the building, and all surrounding areas are equally warm. Consequently there is no radiation heat-loss through the outside walls, nor any resulting draughts. So the heat in summer stays outside and this prevents overheating inside. Because of these factors the room temperature remains constant and comfortable throughout the year, ensuring a high standard of comfort. In addition, passive houses have super-efficient ventilation systems (MVHR) & low U-values typically between 0.10 to 0.15 ranges, special attention is given to eliminating thermal bridges within the house.

Description
ICF Build Construction, with external brick skin
Warm roof construction, 2 layers of 100mm interlocking insulation,
Ground floor construction 2 layers of 100mm interlocking insulation & 35mm flow screed
Orientation of house & windows to receive maximum solar gain
Open Plan living
Double glazed argon filled warm frame windows (A rated)
MHRVS Ventilation system with heat recovery
Heat harvest from internal flue, warm air is distributed through MHRVS
Closed air combustion log burning fire 15KW
Rainwater harvest, rain water used throughout the house (exc. kitchen sink) tap
Air injected shower heads (uses 70% less water)
Aerators in downstairs taps
No Baths installed in the property (water saving)
LED Lighting & PIR sensors in rooms
Quooker boiling tap (53% energy saving compared to a traditional kettle)
Induction hob (faster & more efficient than traditional electric hob)
Bamboo doors floors skirting stairs (quick growing renewable wood)

I.C.F (Insulated Concrete Form)

The insulated concrete form blocks that we used, were from Logix. They produce several different thickness of EPS foam blocks, we chose the XRV6-5. This block is suitable for Passive-haus buildings and has an overall thickness of 356mm, with a u-value of 0.14 (when the plasterboard is placed directly to the inner side of the block and screwed to the black anchor webbing, and a 15mm cavity between the external brick skin.)

The XRV6-5 block has a thicker outside edge of 128mm a centre core of concrete at 163mm an inner edge of 65mm, and an overall length of 1220mm, each block has “lego” type connecting lugs that interlocks each one together.

We went on a course held by Logix, which was very informative to help understand the building technique. The blocks are light weight and very easy to build and cut. A pump has to be hired to pump the concrete into the cavity (we paid £450 for each pump hire.) We had 3 pump hire, one for foundation, up to 1st floor, up to 2nd floor and then we filled the gables by hand instead of hiring the pump for this small amount of concrete.

Special props were hired from Logix to help access the blocks and straighten the walls while the concrete is poured.

ICF Concrete Mix
C20/25
Slump 120
10mm stone

We used 62.4 m2 of concrete for the house

Logix Blocks Used	Qty
XRV6-5	616
Eco 6 Straights	134
Eco 6 corners	84
Eco6 End Caps	137
Cavity Closures	40







Description
Logix blocks XRV6-5 & corners
Accessories
Delivery x3 trips
Concrete and pump hire

Bricks & Mortar

Take your time, and make sure you choose the right bricks for your project, you can change everything else on a house, but not the bricks! We made sample walls to get the brick and mortar mix to match the farm buildings nearby. Ask your supplier if they can show you a property that has been built in the bricks you are interested in, as they can look very different on mass.
The bricks that we chose were by Charnwood "Sussex Red Multi" We had several special bricks made. Single cants for the arrow slit windows, the headers over the windows were "Hampshire Red Multi." The window cills were old terracotta floor tiles that we found in a retired builders yard. The stone for the parapet capping was cut to order at a local quarry at Lincoln along with the quoins and the stone pillar bases. The bases were rumbled to give them an aged look. The slate roof for the barn were "Weathering Slates" and attached with slate hooks.



We had several trials to get the mortar mix the colour and texture that we and the council liked, When the brick courses were being laid we brushed the mortar with a soft brush to make the stones in the sharp sand stand out.

Sand & Cement	**Quantities We Used in £'s**
White cement	£553.20
Soft Sand	£352.50
Bags lime	£38.64
Sharp Sand	£376.00
Ballast	£145.00
	£1,465.34

Brick Mortar Mix

3 x Soft Sand
2 x Sharp sand
1 x White cement
0.5 x Lime
1 tonne of sand per 100 brick approx.

The bricks on the exterior of the house are only a skin, you can render, clad with wood or stone.
To tie the bricks to the ICF we used special stainless steel wall ties.

Qty	Description
17,500	**House Bricks** Charnwood Sussex Red Multi
28	Charnwood Sussex Red Multi Single cants (arrow slits)
190	Window headers Hampshire Red Multi

Roof

We found the roof tile importer “Heritage Clay Tiles” at a show at the NEC, but the tricky bit was to decide on the % of colours. We wanted an old looking roof with some wobbly tiles but not too wobbly so that it made it difficult to lay. In the end we went for 85% hand crafted and 15% hand made in the colours below.

Qty	%	Colour	Description	Place
4461	40%	Medium	Heritage Hand Crafted	Main Roof
2848	25%	Red	Heritage Hand Crafted	Main Roof
2150	20%	Dark	Heritage Hand Crafted	Main Roof
1613	15%	Red	Heritage Hand Made	Main Roof
72	Same % colours as tiles above		Hogs Back Ridge	House Ridge
25			Baby Ridge	Dorma Ridge
210			Valley Tiles	Dorma
450			1/2 tiles	House
585			Eaves	House

We were a few tiles short so the rep brought over a few extras in the boot of his car!



House Clay Tiles



Barn Weathering Slates
The slates were attached with slate hooks

Quantity	Description
	House Roof Trusses
26Lm	Natural Stone Parapet Capping
8	Natural Stone Quoins
11	Natural Stone Pillar Bases
55.5m2	Weathering Slates On Barn
11 bxs	Slate Hooks
16 weeks	Hire of Independent Scaffolding

Rainwater Harvest

The rainwater harvest system has been so beneficial in many ways. We installed a RWH tank mainly because we did not want a water softener, but the knock on effect has been three fold.



We have the whole house plumbed into rainwater, except for one drinking tap in the kitchen, so all the showers, toilets, washer, dishwashers etc use this water. Our tank is filled via rain from the house and the garage roofs. The pump for the tank is submerged in the tank 6500 ltr tank, and there is a filter that filters out leaves and debris. If we have a dry time then the mains water automatically switches over and we use mains water when the water level is low, The water runs through a UV filter to kill any bugs and through a taste & taint filter.

Benefits Of Rain Water
Extend the life of your water appliances
Eliminate white marks on glasses and cutlery
Banish lime scale in loos, taps, and shower heads
Prevent limescale build up in pipes avoiding costly repairs
Lower or eliminate your water bill
Soft Smooth skin without moisturizing along with soft silky hair
Keeps tiles & shower screens free from water marks
Elevate eczema & dry skin conditions, experience softer skin and silky hair.
Save pounds on cleaning products (saving the environment) and helping septic tank digest
Enjoy better bubbles with shampoo and soap.



We located & installed the tank, then our plumber, plumbed up the units:-

1 x 300 ltr Solar hot water unvented cylinder.
Harvesting changeover connections.
UV filter, (Sterlight Silver, Viqua) taste & taint filters.
Discharge & pressure relief.
Cold mains balanced pressure manifold.
1st & 2nd fix pipework
Outside tap & stub stack
Labour

An outside tap is excellent for washing cars in the soft water, as you do not need to leather the car off!

Flooring, Bamboo & Stairs



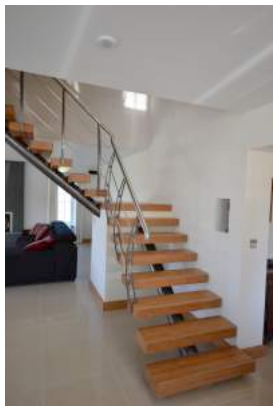
We wanted to use a sustainable wood for the stairs, doors skirting and architrave, so decide to go for bamboo.

Bamboo is one of the hardest natural materials available for flooring doors etc and is an excellent alternative to hard wood. Bamboo has a higher fibre rating than any hard wood, which gives it exceptional hard wearing qualities, it is made from fast growing grass which is replaced much more easily than trees, so bamboo floors are a very popular choice as a sustainable flooring. Because its made from grass rather than wood, bamboo floors are not prone to shrinking and expanding in the same way as wooden floors because of their moisture resistant qualities.

Stairs are a big part of a new house budget

We made our own stairs using local trades men and companies to cut out the metal work and then “Bamboo Surfaces” made the stair treads.





We had a few curved walls in our house, so we purchased laminate bamboo for our joiner to make-up flexi skirting.

Description	Qty
Carbonized Bamboo Flooring Office	15m2
Cushion Under lay + Del £40	3 pk
Gloss Ceramic floor tiles (B&Q @ £7.90 m2)	90m2
Skirting 2400 x100	53m
Stair treads (with stainless steel tread insert) & landing	13
Bamboo doors chipboard core faced & grooved 826 x 1981	9
Bamboo door lining	9
Flexi skirting veneers and sundries	
“Avant Garde” lever door handles	9
Eco joists first floor	
Flow screed @ 35mm thick	125m2

Ventilation & Insulation

sus·tain·a·ble
Able to be maintained at a certain rate or level, Energy efficient

The key to a warm house is insulation, and being air tight. When a house is air tight it has to have a ventilation system, HRVS (heat recovery ventilation system) this will ensure that all of the stale air is removed and fresh filtered air is supplied back into the house, with our heat recovery unit we keep 95% of the heat within the house. We also harvest heat from the log burner void around the insulated flue which is then pumped around the house via the HRVS





The insulation that we used in the ground floor and in between the rafters was Xtratherm. We have a warm roof which means that the temperature in the loft is the same as in the rest of the house. For the roof we used two layers of Xtratherm, one layer fitted between the rafters and the other layer above the rafters, we also used expanding foam between the rafters to make the whole roof was airtight. In the floor slab we used two layers of insulation, one laid vertically and the other horizontally with interlocking edges, this eliminates any gaps.





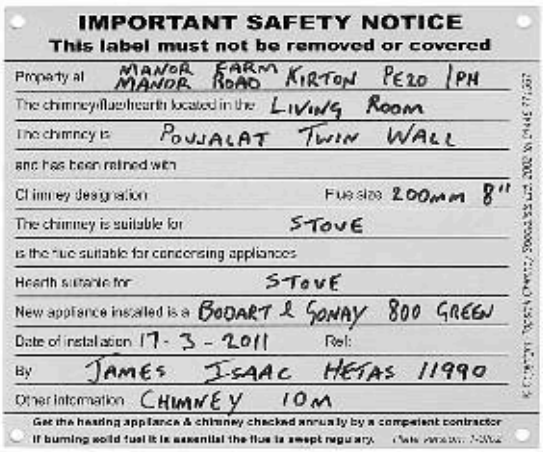
Description
Xtratherm PIR Rigid insulation board 2400 x 1200 x 20mm
HRVS Hellios 350 SHE
Site Support Day
Commissioning visit

Log Burner



Our source of heating within the house is a log burner, Bodart & Gonay, Design 800 Green. (We only use this in the depth of winter as the house maintains a comfortable temp for the rest of the year) The log burner has to be “closed air combustion” because the house is airtight, The installation has to be signed off by a Hetas approved fitter for the council to sign the house off for completion. We installed a twin insulated flue up the cavity of the chimney breast so that we could harvest the heat into the HRVS. We use approx 2.5 tonnes of hardwood logs a year (*depending on the winter.)

Name	Description
Bodart & Gonay	Design 800 Green log burner
Jimmy Isac Boston	Hetas approved fitter, accessories twin insulated flue etc


IMPORTANT SAFETY NOTICE
This label must not be removed or covered
Property at MANOR FARM MANOR ROAD KIRTON PE20 1PH
The chimney/flue/hearth located in the LIVING ROOM
The chimney is POUJALAT TWIN WALL
and has been relined with
Chimney designation Flue size 200mm 8"
The chimney is suitable for STOVE
Is the flue suitable for condensing appliances
Hearth suitable for STOVE
New appliance installed is a BODART & GONAY 800 GREEN
Date of installation 17-3-2011 Ref:
By JAMES ISAAC HETAS 11990
Other information CHIMNEY 10M
Get the heating appliance & chimney checked annually by a competent contractor
If burning solid fuel it is essential the flue is swept regularly

We have in the two en-suites electric towel rails that is on a spur timer and comes on for 1hr in the morning and evening on economy 7.

Windows Doors & Painting

We spent a long time researching windows, and we final decided on the PVC double glazed units, with argon filled and warm spacer bars, we particularly like the windows from Frame Force because they could paint the PVC frame in “French Grey” on the outside, and an off white on the inside. (12 year paint guarantee) We like wooden windows but worried about the wood moving and shrinking and loosing the airtightness, and they were very expensive, we looked at engineered wood but found them still quiet expensive.

The upstairs windows have floating mullions so that they comply with fire regulations. and the office windows have internal blinds. Solar gain is a big part of the heat for the house so we decided not to go for triple glazing, as this does not allow as much heat in.

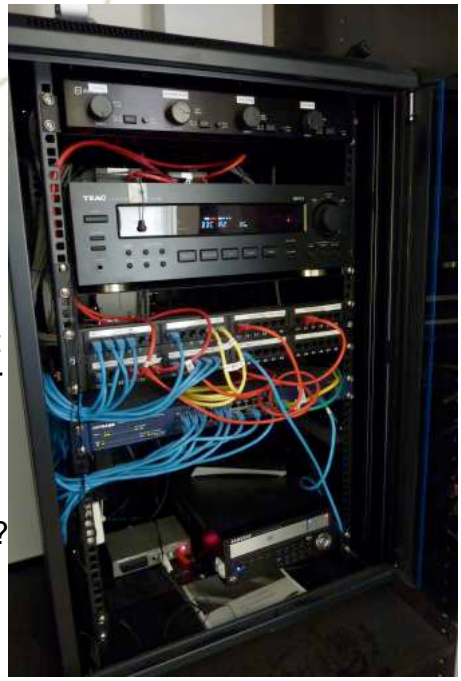


For the internal decoration of the house I bought paint samples and painted sample boards so that I could see which colour looked best in the light of the rooms. I took photos of each room and made notes of what colour each wall needed to be painted, this was a good guide for the decorator and also a handy reference for any touch up at a later date!

To match to the Farrow & Ball French Grey we used the RAL colour 7032

Qty	Window Description
1	Half glazed front door
1	Pair French doors
1	Bay window
2	Large office windows, with internal blinds
2	Arrow slit windows
5	Windows upstairs with floating mullions
6	Windows, ground floor
2	Velux windows

Electrics & Garden



A successful lighting scheme can bring a house to life. It can enhance and create focus around furniture, architectural features, walls and floors. Too often lighting comes bottom of the list when it comes to designing a home, so don't leave planning your electrics until the last minute. As soon you have your plans drawn and passed by the council, start to think how you would like to lay out the electrics, If you already have furniture, make scale drawings to that you can see how each piece of furniture will fit in the room. Imagine were the bed will go in the bedroom, and were the TV will be sited, have you got an island in the kitchen? Do you need electric (or plumbing) for dishwasher, hob etc? Would you like subtle night lights to come on in the bathroom on a PIR sensor? Would you like lamps to come on via a switch at the door? It may be handy to have a cupboard light that comes on when the door is opened? or sockets inside cupboards?

Don't forget about outside lighting, Would you like to have lighting on the patio, or feature lighting in the garden or a pond? if you are unsure lay a pipe with rope inside, so that electrics can be pulled through at a later date.

CAT5 is another very important cable to be install in your house. CAT5 is a data cable that can transmit data to and from computers, TV, telephone, radio etc etc. even if you do not think that you will need for it now, put it in! You can always connect it up at a later date, (200m roll of CAT5 cost approx. £77) Along with the CAT5 cable think about music speakers, would you like to listen to music in the shower? while ironing in the utility? On the patio while having a BBQ? it is all so easy to lay during the build, but very difficult to hide wires at a later date.

GARDEN



Some people are really keen on their gardens, while others are not so interested, try to think about your circumstances, do you have children that would like to play football? or do you need a garden for a pet or dog to run in? I like to a see a nice garden without too much work!! so I chose to have the large gravel areas, by doing this I reduced the work on the flower borders and the grass cutting.

PLANNING

Lay pieces of rope and planks on the ground to design the garden, this gives you an actual feel for size and space. As soon as you can start planting so that plants can get established.

Qty	Description
34m2	Patio slate, Charcoal black Brazil 60x40cm
2 bags	Larsons Flexible grey grout
54.1m2	Woburn Rumbled Antique Small/Med/Large

Contact Addresses

Name	Description	Contact
Brick Engineering	House Bricks	01775 723832
Toolstation	Stainless steel wall ties	www.toolstaion.com
Jewsons	Farm Wall Bricks & Patio bricks	www.turnbull24-7.co.uk/
Heritage Clay TIles	Clay Roof Tiles	www.heritagetiles.co.uk
Centurian Dimensional Stone Co Ltd	Natural Stone Cut To Size	www.cdscompany .co.uk
Roofing Superstore	Slate hooks	www.roofingsuperstore.co.uk
Moso Bamboo Surfaces	Bamboo doors, skirting etc	www.mosobamboosurfaces.co.uk
Kirby & Wells	Door handles	www.kirbyandwells.co.uk
Micheal Evans Ass. Ltd	Structural Engineer	Tel 01332 871840
PLR Kitchens	Kitchen & Utility supply & fit	plrkitchens@googlemail.com
Castlebuild Scaffolding	Independent scaffold hire	tel 01775 719222
Robinson Manufacturing	Ecojoists	www.robinsonmanufacturing.co.uk/
Logix	ICF blocks	www.logixicf.com
UK Flooring Direct	Office bamboo flooring	www.ukflooringdirect.co.uk
RML	Eco Joists	www.robinsonmanufacturing.co.uk
FSF	Flow Screed flooring	www.flowscreedfloors.co.uk
Insulation Shop	Xtratherm PIR insulation	www.insulationshop.co/
Allergy plus	HRVS	www.allergyplus.co.uk
Bodart & Gonay	Logburner - Design 800	www.Hestia.co.uk
Jimmy Isac	Hetas Approved fitter	www.jamesisaacstoves.vpweb.co.uk
Needo	Electric heater	www.needo.eu/
Frame Force	PVC windows	www.frameforce.co.uk

Completion & Conclusion

When you have finished your project, the building inspector will carry out his final inspection along with your warranty inspector, They will supply you with completion certificates to enable lenders to lend on the property. There are quiet a few documents from each trade that need to be submitted, so check with your local building control to see if there is any additional paper work needed to the list below.



Description
E.P.C Energy Performance certificate
Part P Electrical Certificate
SAP Certificate
Pressure Test Certificate
Fire Alarms Installed
Heat sensors
Water Consumption Certificate
Ventilation Certificates & Commissioning Certificate
Hot Water Storage
Log Burner Hetas Certificate
Intake Blending Valve (bath)
Any Outstanding Conditions

Conclusion

Geoff & I wish you the best of luck with your echo build, and hope that this information has been inspirational and informative, and helping you to understand that sustainability is available to everyone who wants to build a house even on a small budget.

We are completely impartial and freelance, we do not work on behalf of another company nor do we receive a commission from the products that we have used in our build, so we are unbiased in our choice of materials and designs, just inspired by what has worked for us.

Happy Building!!

All information was accurate at time of printing, no responsibility can be held for any of the Information published.