The Ferndale Flat

Ferndale, Shipton, Much Wenlock, Shropshire TF136LB

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Construction Information: An Outline

(i) Stage 1: Basic Beamlock Frame

The building is constructed almost entirely of wood, sitting on a Beamlock frame of posts and beams. There is a set of concrete foundations on which the Beamlock frame rests. Each post has an adjustable foot (to enable the frame to be levelled) which is bolted down to the foundations. The Beamlock system uses stainless steel cruciform plates to which the beams are fixed to the top of each post with steel pins. Aluminium plates finish off each junction. (See page 2)

The Beamlock posts and beams are made up from laminated sections of high quality Scandinavian softwood. The company (Finn Forest) claims that the components are as strong as oak but with none of oak's problems of movement or high costs.

Whilst the digger was on site to excavate the foundations, a trench was dug from the house and ducting installed for the water, electricity, broadband and heating oil supplies.

Erection of the Beamlock frame is very straightforward, requiring no more than two people (though I did it singlehandedly), a hired crane and a hammer to drive in the pins. The cruciform jointing system ensures that the framework is pulled tight and square. The foot plates require holes to be drilled into the concrete foundations (4 per post), stud bolts fixed with resin and, later, when the resin is set, nuts tightened.

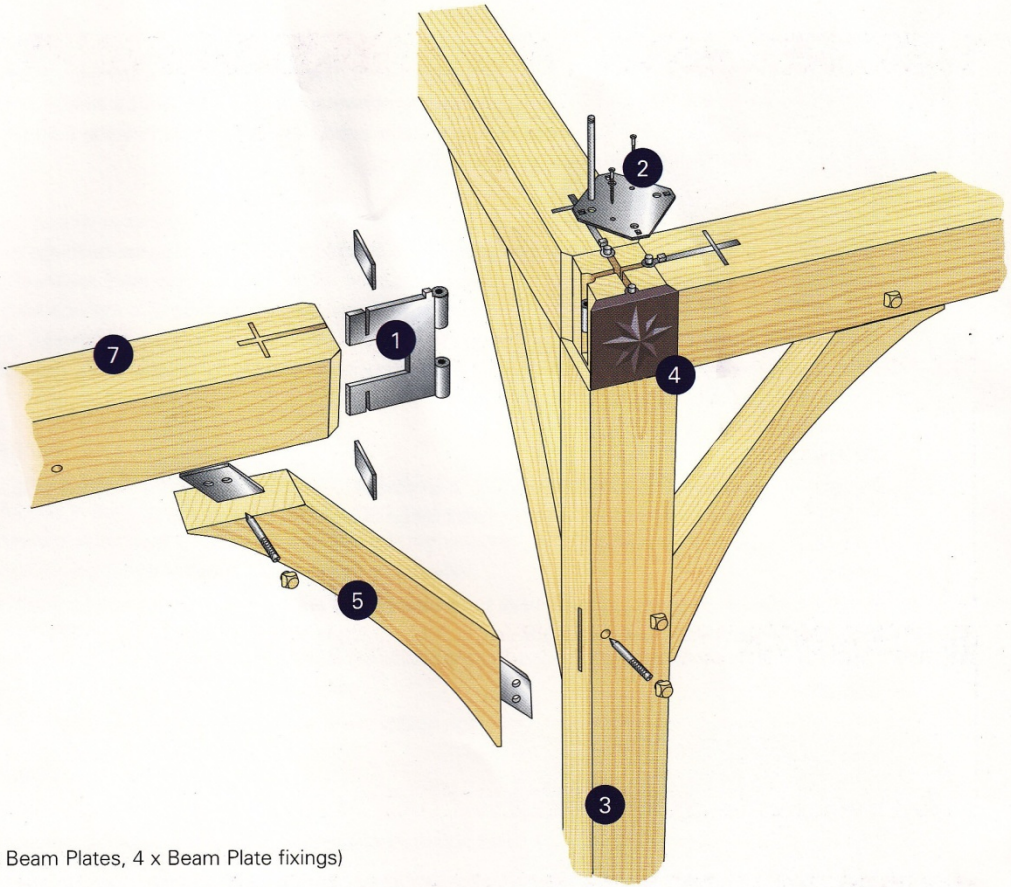
Diagonal braces were installed at several of the junctions of post and beam, according to Beamlock's plans. These require slots to be routered to take the metal ends of the braces and holes drilled for metal pegs to be hammered into the braces. A plastic template was supplied for this work. A good router is needed, plus a long bit (obtainable from the Beamlock suppliers). Installing these braces and lining up the holes for the metal pegs was the most tricky part of the Beamlock construction.

The Flat is based upon a standard Beamlock 4-bay kit of posts and beams, bay 4 forming the entrance to the Flat with the bathroom behind. The three other bays are open-fronted for the car, ride-on mower, log storage etc. The central heating boiler and electricity switchboard are in a cupboard at the back of bay 3.

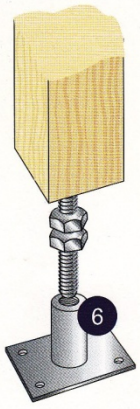
A further variation from the standard kit was the balcony. The posts for this are at standard length but the beams had to be cut to fit and routered to take the cruciform fittings. A Beamlock template ensured that this was not a problem.

Beamlock kit, plus some other timber requirements: Benfield ATT, Monmouthshire 01291 437050 www.benfieldatt.co.uk
Groundworks (including the new drive) by Frank Breakwell, Much Wenlock 01952 727942
Crane hire: Wildes Plant Hire, Dorrington 01743 718777
Concrete for foundations: Readimix, Bromfield

COMPONENTS



1. Beam Kit (2 x Beam Plates, 4 x Beam Plate fixings)
2. Post Kit
3. Post 2165mm (max eaves height 2.2m)
4. End Tension Plate
5. Brace
6. Base Plate
7. Beam (available in suitable lengths of 2628mm and 4968mm)



We have carefully selected post length and thought about beam dimensions to make sure that they are appropriate to fit with standard doors, windows, patio doors, garage doors, patio frames, garage frames, etc. However, to guarantee a fit for every possible alternative you can cut the beams to your chosen length. All you need to do is cut the beam to your chosen length, and by using the templates supplied, router the appropriate grooves and chamfers to fix the Beamlock beam connector.

It's as simple as that.

The Beamlock Locking System

www.finnforest.co.uk

(ii) Stage 2: Roof Trusses

A basic Beamlock garage could have roof trusses set directly on the frame but to get a reasonable upstairs ceiling height in the Flat, a one metre upstand was first constructed. The floor joists were installed next, with some temporary plywood sheets to give a platform for working on the installation of the roof trusses. The trusses were designed by Benfield ATT's in-house structural engineer and were lifted into place, using the same crane as in stage 1. Whilst I did this singlehandedly, it would have been much easier to have had a second person to signal to the crane driver. The trusses are braced and fixed with both brackets to the upstands and metal straps to the Beamlock frame. The roof trusses are very strongly constructed to prevent spreading under the weight of the tiles so that the upstairs headroom in the Flat is not obstructed by tie beams. Hence the need for calculations by the structural engineer.

At the same time as the roof trusses were being hauled into place, a stonemason was building the retaining walls around the top end of the drive. The stone came from the quarry at Diddlebury, just a few miles away, and is a perfect match for the stone found here.

(iii) Stages 3 & 4: Frames and External Cladding

Framework for the stud walls at both ends and between the bedroom and the main room was installed next, incorporating door frames and windows. These stud frames are braced to help with the rigidity of the upstands. Next, four brick courses were laid on the foundations, between the posts, so that the stud framework on the ground floor could be installed.

The external cladding is pressure-treated feather-edged softwood with the sawn edges treated with wood preservative, nailed at each stud upright and fixed over a breathable membrane. Later, the cladding was given two sprayed-on coats of preservative.

Once the scaffolding was erected, cladding was continued on the upstand above the Beamlock beams and at each end.

Windows, internal "cottage" doors and external doors: Jewson Ltd

(iv) Roof

First, the breathable membrane was installed in manageable sections and tile battens nailed down. Next, the Velux roof windows and their flashing were fixed. Tiling could begin (but not too many at a time on one side in case the weight became unbalanced). The clay roof tiles were chosen to match those on the house. Carrying an armful of the 4000 tiles at a time up the ladder was, of course, cheaper than hiring another crane. A second lift of the scaffolding was necessary to enable the ends of the building to be cladded and the eaves finished off.

The solar water heating tubes were installed whilst the scaffolding was still in place and before the last rows of tiles were fixed. The rainwater gutters were also installed before the scaffolding was removed.

Tile supplier: Brian Mears Brick Library, Ludlow 01584 876351
Tile manufacturer:Dreadnought Tiles, Brierley Hill 01384 78361
Scaffolding: Keith Phasey, Ludlow
Solar water heating: Solar Dawn
Velux roof windows: Jewson Ltd
Tile battens: Jewson Ltd

(v) Electrics, Heating and Plumbing

Now that the building was watertight, the floor panels were installed and work began on installing cabling for lighting and power points. Once these were in situ, insulation was placed in the wall and ceiling voids and plasterboard fixed, starting at the bedroom end. A panel lifter was hired for fitting the ceiling plasterboarding so that this work could be carried out by one person.

Meanwhile, the heating engineer set the water tanks in the roof area (at the kitchen end) and ran the necessary pipework to the boiler in bay 3, hot and cold supplies to the kitchen sink and to the bathroom and central heating pipes to the radiators in the bedroom, sitting area, hall and bathroom. Mixer valves were installed on the bathroom hot water supply to ensure that no-one could be scalded by the potentially very high temperatures reached by the solar water heating.

An extra water tank was placed in the roof to feed rainwater to the loo. More on this later.

Once the ceramic floor and wall tiles were fixed downstairs, the bath, loo and sink were plumbed in.

Heating Engineer: Nigel Bennett, Benthall 01952 882864
Hired equipment: Hire Equipment (Ludlow) Ltd, 01584 873679
Insulation: Jewson Ltd
Bathroom Suite: Jewson Ltd
Floor and wall tiles: Jewson Ltd
Border tiles for wall: Craven Dunnill, Bridgnorth 01746 761611
Screws etc: Screwfix 0800 0567689
Ironmongery: Ironmongery Direct 01702 562770
Electrical goods: QVS 0800 1976565

(vi) Second Fix Woodwork and Decorating

Architrave was fixed to the door and window frames and skirting board all round. In the main room which was to have a parquet floor, the skirting board was set high enough to allow the parquet flooring to expand if necessary.

The joints in the plasterboard were taped and filled and the walls and ceiling papered with a textured wallpaper which disguises any imperfections. This saved bringing in a plasterer to skim the plasterboard (but the textured paper proved to be very difficult to paint). The ceilings, walls and woodwork were painted.

The next stage was to lay the oak parquet flooring which is glued to the chipboard underfloor, sanded and treated to two coats of wax oil.

Meanwhile, the paving slabs at the front were laid, brick plinths set at the bases of each Beamlock post and a layer of local gravel spread over the top section of the driveway. A local tradesman did this work.

Architrave, skirting boards and doors: Jewson Ltd
Special shaped bricks for the plinths: Brian Mears Brick Library, Ludlow
Local gravel: Bromfiled Sand and Gravel, Ludlow 01584 856258
Sand, cement, paving slabs etc: Jewson Ltd
Parquet floor: Precious Earth, Ludlow

(vii) Kitchen

The kitchen units, fridge, cooker, sink and washing machine were installed, with oak worktops. The units that would otherwise be open at the rear had a plywood panel fixed to the backs, with an access panel to enable cables and pipework to be reached if necessary. To the right of the washing machine, another panel gives access to the hot water tank and solar water heating controls. Wall tiles were fixed on the sink side of the kitchen units. The kitchen and washing machine waste pipes plus the waste pipes from the bathroom were connected into the existing drainage system from the house which, helpfully, runs close to the new building and leads to a septic tank.

Kitchen units and worktops: B & Q, Hereford

(viii) Tank Room

An insulated tank room was constructed under the balcony to house two large, second hand plastic tanks (previosuly used for fruit juice) for the collection of rainwater to flush the loo. A pump lifts the water up to a header tank over the kitchen area. There are a few complications in this set up: (a) a float switch in the water tanks operates if the tanks run dry (b) a valve on a mains water supply to the header tank opens in the event of a power cut so there is still water available for loo flushing (c) filters on the rainwater downpipes ensure that no leaves or other debris reach the storage tanks.

Recycled fruit juice tanks: Cambers, Harley 01952 510481
Wisy FS rainwater filters: Rainharvesting Systems 01453 836817
Pump: Machine Mart Ltd

(ix) Staircase

The original plan was to construct an oak staircase using locally grown timber but this proved to be much too expensive so a softwood and plywood staircase was built and later carpeted. This was a challenging excerise in exact measurement and careful routing of mortises in the strings for the stair treads and risers, using a staircase jig.

The staircase was assembled in situ with the treads and risers glued and wedged into the strings. Then it was possible to build the upstairs ballustrade and the plywood wall between the stairs and the hall and bathroom.

Once all this was complete and decorated, the carpet fitters were able to carpet the bedroom and stairs.

Timber for the staircase: Jewson Ltd
Staircase jig for routing: The Axminster Power Tool Co 0800 371822
Carpet: Crown Carpets, Church Stretton 01694 723832

(x) Final Jobs

The porch was constructed, with the posts sitting on the paving slabs and using the same tiles as on the main roof. A cupboard was built around the heating boiler. Insulation and fire resistant plasterboard was erected on the garage ceilings with an intumescant sealer injected in all the joints. Some pipes needed insulation and boxing in. Lights were installed in each garage bay.

To meet Building Regulations, the electrical installation was checked by a qualified electrician and a certificate issued.

Plasterboard: Jewson Ltd
Electrical testing: Church Stretton Electrics 01694 724607

(xi) Timescale

Except for specialists who did the groundworks, heating and plumbing and stonework, the building was erected single-handedly over five years. Planning permission was granted in November 2004. Work began with the excavation of the drive in June 2005. The building was ready for letting in June 2010.

Mike Brogden
November 2010