STRAW BALE EXTENSION

Inkerman Cottages, Chesterfield

Other 'eco' measures installed at Inkerman Cottages

The house consisted of the original 2 bed end of terrace house with a 2 room extension (I up, 1 down) added around the year 2000.

The original house has solid walls with the extension having more modern brick and block construction.

Renovations took about 6 months and included removing the solid fuel back boiler in the kitchen which was replaced with an electric oven and utilised the existing chimney for the hob vent. There is no mains gas so a gas hob is fed by 2 propane bottles outside.

In the original 1890 built house the walls were internally insulated with a stud wall and 100mm of sheeps fleece. Sound insulation panels made of recycled car tyres fixed to the party walls.

Oak framed straw bale walled extension

This extension filled in the area left by the previous extension, squaring off the resulting L shaped house.

To add interest the walls were curved (in retrospect making a lot more work and waste!). The windows face east and south to get solar gain in the morning with a solid wall to the south to prevent overheating.

From the beginning I decided I wanted to do as much work as possible myself. The eventual design consisted of an oak frame (from Gregory's in Darley Dale) hung off the existing walls with the walls made of straw (very tightly packed bales from Sillitios farm in Sutton in Ashfield).

A local builder dug the foundations and built the low brick walls for the bales to sit on (the only outside contractor used).

After that was finished the oak frame was erected using sheerlegs and a chain winch. The oak moved around site on

In the sitting room a Morso multi fuel stove was installed with a stainless steel chimney liner. The back boiler connected to the hot water tank.

The hot water tank was replaced with a larger one containing 1, a heat store coil at mains pressure for the shower 2, electric immersion heater 3, coil fed by the Morso stove 4, coil fed by solar hot water panel 5, spare coil.

On the ground floor the concrete floors were covered by a damp proof membrane, wood fibre board insulation and cork.

Original solid fuel boiler for central heating replaced with an electric wet central heating boiler.

The attic converted into a bedroom with huge amounts of sheeps fleece filling the space and 100mm sheets of insulation on the sloping ceilings. Triple glazed skylights with solar powered remote control blinds.

wooden rollers. The oak was extremely heavy being 'green' and the rafters 8m long, 8" x 2". The vertical posts were slotted using a chain saw and fixed with through bolts onto custom made galvanised brackets bolted to the concrete foundations.

Once the rafters were erected a framework of cross beams was put on top to support a roof of 1" thick ply. Two triple glazed skylights (Fakro) inserted. Then a rubber sheet covering the whole roof. On top of that a layer of old carpet (from Freecycle), a layer of gravel, weed control fabric the 2" of topsoil sown with sedum plug plants.

With the roof finished the straw bales were delivered. A wooden beam of ply and a 'railway line' of 3' x 2" built around the ply beam. The cross pieces drilled to accept sharpened hazel sticks to hold the bales in place.

The bales then built up as far as possible and the triple glazed windows (Green Building Store) instead between wooden uprights. Once complete another wooden beam put on top and the two beams pulled together with wire loops and turnbuckles. The gap between the beam and roof filled with straw stuffed in.

Once the bales were in place the lime plaster was put on. Many weekends with a team of volunteers mixing lime (from Buxton), sand and water. The first two coats put on by hand then on the outside the last coat put on with a trowel, internally by hand.

Externally covered in a light green lime wash, internally a white lime wash.

Internally there is a thick concrete slab to stabilise the internal temperature (in retrospect should have been thicker) covered in a wooden framework and floor boards.

The ceiling has about 400mm of insulation, a mixture of sheeps fleece and recycled plastic bottles with the standard plasterboard ceiling.

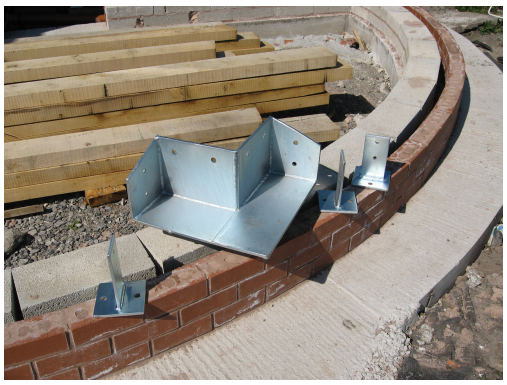
Internal temperature rarely falls below 13c and there is no heating other than a butane powered stand alone heater which is used occasionally.

Lighting is a mixture of mains and solar powered by panel and battery.

Sheeps wool internal wall insulation.

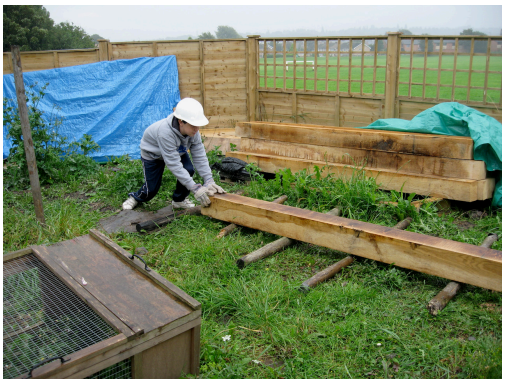
Morso multi fuel stove with stacked oak sawdust compressed logs.

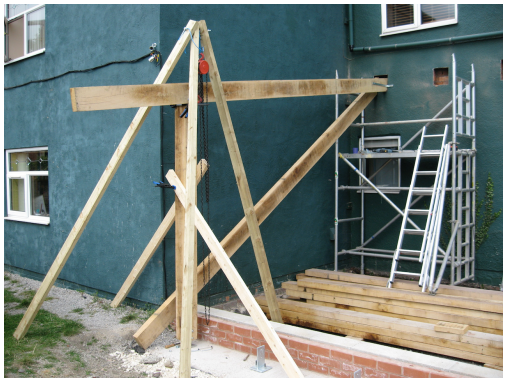
Sheeps wool insulation in the loft.



Straw bale extension base wall on concrete foundation with custom made galvanised brackets.

Oak post uprights being moved around on wooden rollers.

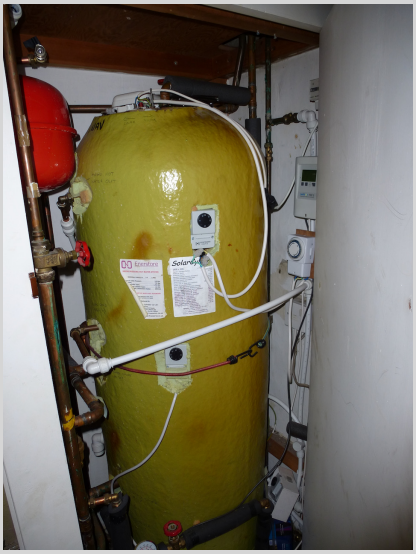




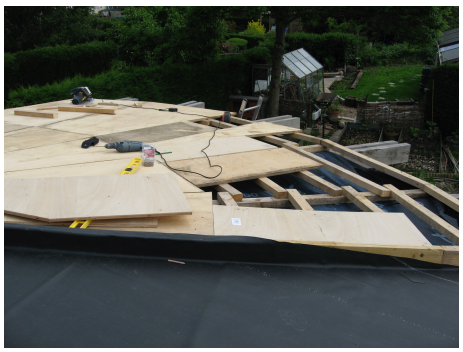
Erecting the first rafters using sheerlegs and chain hoist.

Frame gradually going up.

Internal view of completed rafters with roofing felt and skylight above.



Hot water tank with various inputs.



Plywood sheets being installed on the roof.

Green roof layers installed and being planted with sedum plugs.

Willow pegs installed ready for the bales.

Applying lime render.

Straw bale walls from the outside.