RESTORATION

The short days and poor weather in the first few months of 2013 delayed the start of the necessary repairs. To complicate matters further, planning permission requires a bat survey by a qualified consultant to ensure there is no disturbance to any resident colonies. Because bats hibernate in winter – usually in caves, abandoned tunnels and buildings – the survey work can only take place in summer.

Work begins (March and April 2013 - note the winter damage to the dairy roof)

Nevertheless, preliminary repairs eventually began at Easter, but it rapidly became clear the job was bigger than it first appeared. Most significantly, it was clear the walls were so damp that the first floor was no longer attached to the walls. In practice it was being supported by the wonderful – but out-of-place - modernist fireplace in the lounge.


The chimney place turned out to be all that was supporting the first floor

To complicate matters further, our architect had to withdraw due to ill health: although not before she had advised making the building as structurally safe as possible while awaiting the bat survey. This effectively meant gutting the house, taking down most of the dairy and attempting to repair the kitchen.

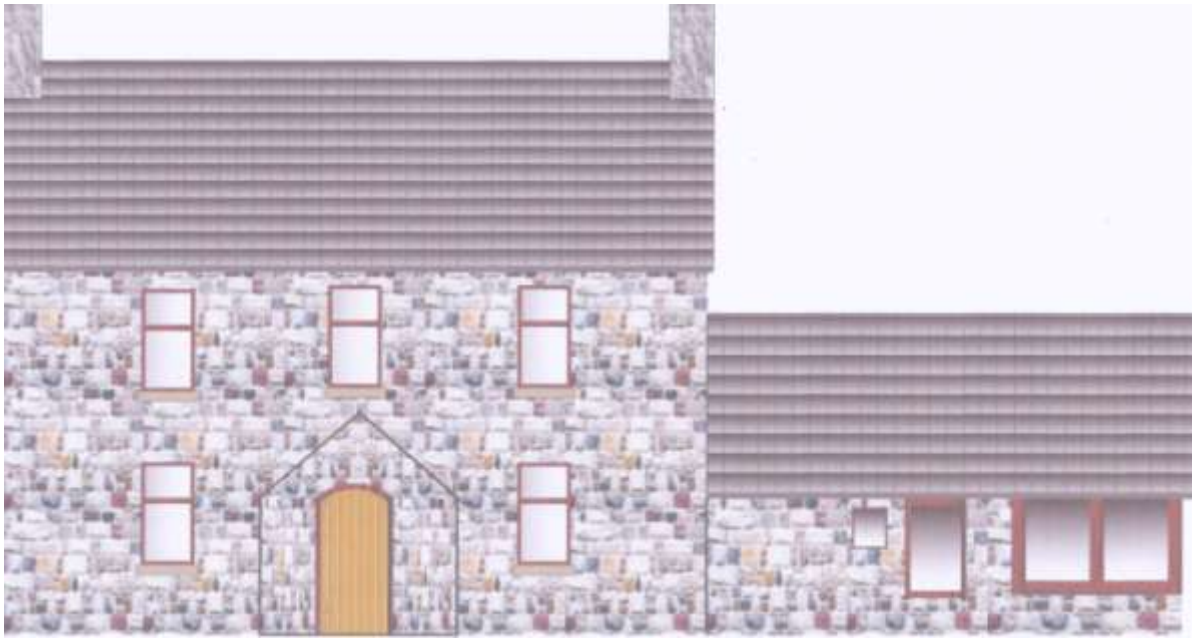
The bat survey eventually came back 'clear' in June 2013, but by this stage the entire first floor and staircase had had to be removed. As the dairy roof was removed, it became clear the chimney at the eastern end of the building was very unstable, requiring the erection of buttresses (now largely disguised as the downstairs bathroom). The thick stone walls of the kitchen also proved so rotten as to require demolition. Despite still not having put in for planning permission, safety considerations meant this also had to be taken this down. It was replaced with a new building with an identical footprint and external appearance.


The interior was gutted and the chimney supported with buttresses (now the downstairs bathroom)

It was at this point – late summer 2013 – that the National Park planners spotted the work and decided we were acting without the necessary paperwork. Apparently even if a structure is unsafe, taking it down requires demolition consent. Not only that, once it has come down, formal permission is needed to reinstate it. Obviously we immediately applied for planning consent. This covered for retrospective demolition and the restitution of both, plus the restoration of a modest extension on some of the 'footprint' of the previous diary and milking parlour.

THE PLANNING PROCESS

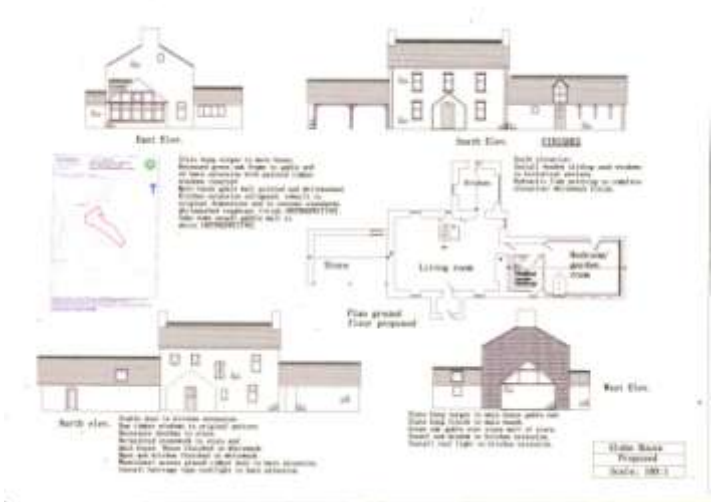
After a considerable delay, in December 2013 we were summoned to discuss the application with the planning officer. It was strongly hinted that were we to want to restore and convert the dairy, we needed to make a significant gesture towards traditional appearance. To this end, replacing the 1960s-style windows on the front of the house with sash windows would be a very good idea. It was suggested that were we to be difficult, the prolonged lack of occupation might become a problem. We were invited to produce evidence of when it was last occupied and to produce photographic evidence of its historical appearance.



The original drawing for the preliminary planning stages (2013)

Now planning permission is not needed for repairs to an existing dwelling. By this stage we had already bought all 12 new windows for the house (five for the front, four for the rear, two for the kitchen and one more on the east side, next to the passage to the new extension). The end result was that all work was frozen while we attempted to resolve the issues.

The cost of new sash windows appeared not only unreasonable, but also very expensive. So we put in for permission to restore not only the dairy, but the milking parlour and forge (the idea being to make 'sacrifices' of parts of these extensions to get what we really wanted).



The revised plans with two extensions

In the end, however, we realised the five potentially 'wasted' windows at the front of the house could be reused in the extension. So when the drawings went in, there were sash windows on the house – we were advised that if they weren't there in the event, there was nothing the planners could do.

The drawings of a sash-windowed Glebe clearly sugared the pill, because – to everyone's surprise – the plans were passed in their entirety. But better still, while waiting for the decision we had stumbled across another supplier who could make sash windows that were only a little more expensive than the ones they were replacing. And they do clearly look much better in an old building than modern designs.

So everyone was happy – but we had ended up with a building that was very much bigger than originally intended. Should we stick to the original scheme or be far more ambitious?

Ready to start the next phase (December 2014)

TECHNIQUES

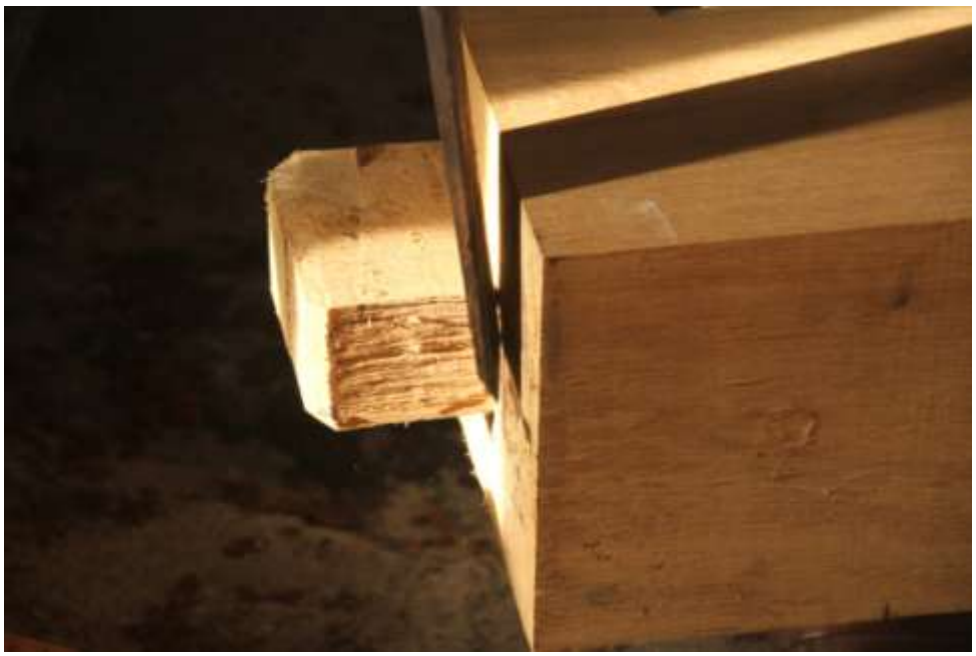
Building materials have changed hugely over the years. Modern walls are generally made of a mixture of treated softwood, bricks, blocks, damp-proof membranes and conventional cement mortars. In other words they are designed to be as water-tight as possible.

Older walls tend to be made with lime mortars. Because until recently it wasn't possible to exclude water totally, old buildings are expected to 'breathe' – to absorb some moisture, but also to be able to release it.

Both principles work well, but it also means it is usually a mistake to mix the two types of material in the same building – or, more importantly, in the same wall. Water is expected to permeate into an old wall from above, below and the exposed surface, but lime mortar allows damp to escape back to the outside air. Conversely, a modern wall is expected to be fully watertight, so using lime mortar with modern bricks would allow driving rain in, but the rest of the construction materials would keep it there. Thus Glebe House contains three main building techniques: two ancient, one modern.

- Green oak framing

In the days before mechanical saws, our ancestors used fresh oak to construct sturdy wooden frames held together by pegs. The last are not rounded on a lathe, but whittled to produce a foot-long poly-sided wooden nail. Holes of a fractionally smaller diameter than the peg are drilled into each mortice and tenon joint from either side at slight angles to meet in the middle. This creates a hole which is effectively slightly curved. The peg is then greased with candle wax and hammered home. Once in, the peg's ridges are squeezed tightly against the hole's walls while the tension from being forced into a curve means the peg is held so tightly it can never be removed.



This type of construction is most apparent in the main living room of the old house, but you can also see it upstairs, in the roof of the dairy/parlour extension and in the front of the two store rooms to the west of the house. We have cut off peg ends below eye-level (to avoid accidents), but have deliberately left those higher up to show the method.

- Lime mortar

This has been used since the 4th century BC and is created by roasting limestone (calcium carbonate – CaCO3) in a kiln. The heat drives off the carbon dioxide in the carbonate to create calcium oxide (quick lime, caustic soda or CaO). This is extremely alkaline and reactive, so it is 'slaked' with water to create the much milder calcium hydroxide (Ca(OH)2). The final product has the consistency of a stiff putty or clay.

This will keep for many months in a large bag, but when spread in a relatively thin layer (e.g. as a mortar between bricks or as a render on a wall's surface), the lime absorbs carbon dioxide from the atmosphere to create a relatively soft, slightly crumbly, mortar. This allows a limited movement of water in – and critically out – of the wall. Importantly, in an era of concern about global warming, unlike modern

cements, this is a relatively carbon neutral material because as the mortar hardens it consumes the carbon dioxide driven off in its manufacture.

The main farmhouse and rear wall of the forge were constructed with lime mortar some 200 years ago. A thin 'wash' or render of the same was applied to the walls and this kept out the elements for some 150 years until a 'modern' pebble dash was applied in the 1960s. This kept out the driving rain, but unfortunately it also sealed in water seeping in from the roof and rising damp. As this rose to the surface, expanded with hard frosts, and generally snaked its way beneath the cement, it loosened the render and by the time we bought the house in 2013 most was barely attached to the walls.

We therefore removed all of the 1960s protective covering, leaving the dilemma of what next? Clearly some sort of coating had always been there for a reason, but what next? In the end we have come up with a variety of solutions. We have left the south and east walls exposed because these are relatively protected from the prevailing elements and the stonework is attractive. The northern wall has a lime render – a cross between paint and mortar - using the traditional binding agent of horsehair which was harvested from our own ponies, Spice and Penny. As modern constructions, the kitchen and east extensions have a Portland cement-based render, but we have deliberately roughened this to blend in with the older building.

- Timber frame / breeze block

Modern building methods need less explanation. Foundations are dug and low walls built to create a shallow tank. Then a damp-proof membrane is laid and a modern concrete (Portland cement-based) is poured over a rigid welded wire mesh to make a reinforced concrete pad. Breeze block walls are built up and the inside lined with a light timber frame. This is infilled with the highest modern insulation material available and covered with board and finished with a 'skim' of conventional plaster.


The extension have breeze block walls while the interior is lined with softwood frames

The advantage of this type of construction is that it is cheaper and much more thermally-efficient than ancient building techniques. On the other hand there can be a clash of styles with the older parts of a restoration project.

In the case of the two extensions and the kitchen, while not hiding the use of modern materials, we have tried to smooth out the contrasts between old and new. We have done this with the limited use of green oak and stone, while using deliberately roughened finishes on modern renders.

- Slate

Houses along the coast are battered by frequent storms driving in from the west up St George's Channel. Originally a lime render was the preferred protection (this was usually painted either with a white lime wash or lime mixed with ox blood to produce a characteristic pink effect).

As the Industrial Revolution developed and trains opened up slate mines of Snowdonia, so many Welsh houses started to hang exposed walls with slate.

This began to fall out of fashion during the 1960s and 1970s however in favour of pebble-dash renders made with modern cements. These were applied to Glebe House 32in the late 1960s, but unfortunately the use of an impenetrable barrier on a potentially damp wall was very destructive in the long-run. As the roof deteriorated in the 1980s and '90s water seeped down into the walls causing major damage to the internal floors and joists and slowly detaching the render from the external walls. The last was so damaged that it had to be removed in 2013.

The fact that previous owners had felt it necessary to apply an additional protective layer indicated something was probably sensible. We decided to revert to the traditional slate on the most exposed western walls. When the house had been re-roofed in the late 1990s, they had saved money with an artificial concrete/fibre slate.

Welsh slate is now even more difficult and expensive to source. We reluctantly decided to use the same modern material on the three extensions on the cladding at the west ends of the house and store.

ECO-FRIENDLY

We all need to do our bit to help the planet and nowhere is this more important than in our homes. Buildings account for a sixth of all the UK's CO2 emissions, so it is particularly important to try to take care when renovating or constructing a home.

- Insulation

Old houses are notoriously thermally-inefficient. Thick stone walls absorb huge amounts of energy and much of this will leach out to the exterior (although conversely the stone acts as a nightstore heater by absorbing heat and releasing it inside as well). Similarly slate roofs may be good at repelling the rain, but they are poor at retaining heat while draughty windows act as thermal extractor fans.

In 2012 the house's only insulation was the sheep's wool brought in by nesting jackdaws. So when the scale of the refurbishment became clear and the house had to be gutted, the next stage was to line the entire building with 100mm rigid foam board and a layer of isoprene (a very efficient insulator which looks a little like very sturdy silver bubble wrap). Between them this equates to about 18" of rockwool. The relatively unused attic is layered with an 18" layer of conventional rockwool. All the windows are double glazed, the doors are newly-made and tight-fitting.

- Heat

We looked very hard at various non-polluting energy sources. Ground and air-source heat exchangers, wind turbines, photovoltaic cells and wood pellet boilers were all carefully examined, but each proved impractical. Mains gas is not available, so an oil-fired system was the most sensible option. This heats the house via underfloor pipes on the ground floor and conventional radiators upstairs.

We have installed both a solar hot water system (which should provide up to 80% of the house's hot water in summer and 25% in winter) and two wood-burning stoves.

- Stoves

These are capable of heating the entire house even in the depths of winter. Each comes with a complimentary large basket of logs at the beginning of your visit. There is more wood in the store which was once the smithy. Guests are welcome to help themselves to further wood from the beginning of October to the end of March. From April to September, guests can buy additional wood on an 'honour' basis of £5 per large basket. Please note how many you fill and pay at the end of your visit.

Most people know how to light a fire, but this is particularly easy with the well-seasoned hardwood logs (mainly oak, sallow and ash) that come from Helen's family farm near Llandeilo. Simply open up all the stove vents (particularly the bottom one at the front), place one reasonable-sized log against the back wall, put a firelighter in front and then a smaller log in front of that. Light the firelighter and place a third, smaller, log on top. Within three or four minutes all three logs should be blazing happily. Then shut down the air vents, but if you feel it needs more oxygen, the top vent on the door is the best one to leave open. By all means burn paper, cardboard and driftwood from the beach (this is recycling by recapturing heat and carbon-neutral), but please don't burn plastic. This can coat the window and leave pollutants in the ash which we use as fertiliser on the wildflower garden.

Unfortunately the smaller stove needs regular feeding – particularly if the vents are open – but this can be fun when curled up with a glass of wine, good company or an excellent book. One way of prolonging a burn is to ensure there is at least one reasonably large lump of wood.