



**Plot 6**

# **Paul and Hoppi Wimbush's plan**

## **Plot 6**

### **Lammas**

March 2008

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# **1. Introduction and Background**

We are a family of five. Paul (35), Hoppi (39), Jarvis (17), Jarro (8) and Emba (4). We are, subject to planning approval, planning to live on plot 6 of the Lammas development. We plan to build a timber framed straw bale house and be largely self sufficient. We plan to sell hazelnuts, plums, apples, berries, livestock and gypsy caravans. In addition we intend to run courses on a variety of topics ranging from low impact development to emotional literacy. Paul has played a central role in bringing about the Lammas project and he plans to continue to play an active role in this. Hoppi plans to bring her wealth of training and experience in conflict resolution and communication skills both to the project and to the area.

Paul has a wealth of low impact living and building experience. He spent three years studying Architecture at Cardiff University. He then lived in Tipi Valley for 5 years where he learnt gardening, goat herding, coppicing, green woodworking and simple living skills. Whilst there he built and lived in Tipi's and Yurts. He then spent 5 years living in Brithdir Mawr where he played a central role in managing the 165 acres of pasture and woodland. Whilst there he also learnt hedge laying, dry stone walling, working horses (including teamwork and haymaking), conservation skills, as well as developing his forestry, pasture and horticultural skills. Whilst there he built a timber framed, straw bale, turf roof roundhouse. He now lives in a chalet community on the Gower Peninsular where he works as a carpenter repairing and building wooden chalets. He currently keeps goats and ducks.

Hoppi has a background in teaching and ceramics. She has built and given birth in a yurt and has co-built a wooden chalet. Her passion lies in developing a holistic approach to mainstream education in schools, connecting children and teachers in with their own unique and boundless potential. She is an Integrative Arts Therapist and an accredited Journey Therapist and specialises in Communication Skills and Emotional Intelligence training. She has excellent contacts within the LEA in Pembrokeshire. Jarvis is currently working in a café in Swansea and plans to return to full time education to study joinery. Jarro attends school full time and Emba attends nursery part time.

## **2. The Design**

- **zoning**

Essentially there are 2 hubs to the plot.

The house serves as a domestic hub. On a micro-scale the house is designed around the kitchen. The practical household functions (cooking, eating, composting and housing) radiate from this point. The fuel source is located near to the house where the soil is most shallow. The house overlooks the plot and is situated approximately 100m from the agricultural hub.

The agricultural hub is centred around the barn. The majority of the livestock are housed here as well as the intensive food growing areas.

The water patterns have all been worked out using the available slope. Crops have been sited in the optimum position for soil and aspect.

- **Visual Impact**

### **Layout Overview**

The layout of the plot has been carefully considered over a 12 month period and takes into account climate, soil quality, aspect, visual impact and views. Attached is a gradient survey, a visual impact and habitat survey.

#### **Dwelling**

The dwelling has been sited to overlook the plot, and thus provide us with a view of the movements and condition of the livestock. The options for the positioning of the house are relatively few given the visual impact assessment of the site. It has been carefully positioned to ensure a low visual impact for the farms that partially overlook the plot (Trecnwc, Pencnwc and Parc-gwyn). It has also been sited where the topsoil is the most shallow. The dwelling has been designed to visually blend into the landscape. The more visible aspects of the building have a green roof and a timber framework for climbing plants.

#### **Polytunnel**

The Polytunnel will play a key role in providing our family with year-round vegetables. It needed careful consideration in its siting in order to maximize sun yield and minimize visual impact. The other additional influence in its positioning is to locate it in an area of best soil quality.

#### **Vegetable Garden**

The vegetable garden is sited in the flattest and most fertile area of the plot. The garden will be combined with our duck area in a winning combination which we have used for many years ie, the ducks feeding on garden pests. It requires a 6ft chicken wire boundary to the garden. We have taken advantage of the polytunnel position and used it as a boundary. Similarly this was an influencing factor in the siting of the barn. The garden will be bordered to the south by a field to maximize light conditions in the key growing area.

#### **Orchard**

The orchard has been carefully sited to be sheltered from the cold northern and eastern winds which can damage blossom in early spring. Similarly it has been designed to ensure there are no frost pockets. It has a good south westerly aspect and will be sheltered from the south western winds by a belt of hazel trees.

### **Barn**

The barn has been sited so that it is not overlooked by any neighbours. It will be visible from the permissive footpath until the orchard establishes itself. It incorporates a turf roof in order to minimise any visual impact. The barn will be used to house the cows in wet winter conditions. It will also be a hay/ straw store. It will house the geese (and thus be adjacent to the orchard). It will house our tools and provide us with a workshop space. A food storage room and diary will be included. It will also incorporate a small lean-to greenhouse which shall be used as a drying space for vegetables and also a warmer space to raise seedlings.

- **Land based produce**

### **Livestock overview**

Our livestock choices have been influenced by what already thrives in the locality. Cows are a traditional choice for this landscape. Wild geese have also been observed on the land.

### **Cows**

We are planning on keeping two Dexter cows. They will be kept to produce milk and cheese for the family. The calves will be sold on at 6 months for either meat or as house cows. They will be kept on approx 1 hectare of pasture which will be rotated. Intestinal worms are not expected to be a problem. Adult cattle (over 2 years) generally have a very good immunity and never need worming even when the grazing is not rotated. Exceptions may be if an animal's resistance is reduced by ill health or it is in very poor condition. Young cattle are highly susceptible. However, suckler herds rarely require worming because the calves graze with the cows, which reduce the worm challenge sufficiently so that the calf gradually builds up its own immunity without suffering any ill health effects.

We will use a system of milking which we have used for many years with goats. It involves the cows being separated from the calves in the barn at night with a wattle divide which allows visual contact but not physical contact. The calves do not become stressed, because they can see their mothers. In the morning we will milk the cows and they will be set to pasture during the day when the calves can suckle freely. They will all be enticed back to the barn in the evening with a bucket of feed.

They will be kept in the barn during wet periods in the winter. We may need to use additional grazing and do not foresee a problem with this, having observed many small parcels of grazing being let out on a goodwill basis in the locality.

We will offer other residents the opportunity to become involved with the cows through the "cow club". Katy and Leander of plot 2 are keen to be

involved. This would give us an occasional break from milking.

We are open to the concept of rotating our cows with sheep from other plots, and are currently seeking ways to achieve this within the animal movement/ standstill regulations.

### **Geese**

We are planning to keep two pairs of breeding Brecon Buff geese. These geese are the only breed native to Wales. They will principally be kept in the orchard (approx. 1 acre). Their primary role will be to graze the orchard. They will also be encouraged to sit to produce table and breeding stock. They will be housed in the barn at night.

### **Ducks**

We are planning on keeping about 8 Khaki Campbell ducks and one drake. They will be confined to the garden by a 6 ft chicken wire fence (which should keep the foxes at bay during the day). They will be housed in a rat-proof shelter at night.

### **Chickens**

We are planning on keeping a flock of about 8 hens with 1 cockerel. Their primary role will be to produce eggs, table birds and to provide “broody hens” for the duck eggs. We have chosen a breed called Ixworth. They are one of four poultry breeds considered “critical” by the rare breeds survival trust. They will be kept in a purpose made coop on wheels which will be moved around the plot to provide fresh forage for the chickens and also to maximize their pest control potential.

### **Bees**

Hoppi will keep bees for honey. She will begin by managing two hives and will expand as she becomes familiar with the skills involved. Paul has considerable experience with bees and will advise as appropriate.

## **Area by area**

### **Vegetable Garden**

#### **approx 600 sqm in cultivation (not including Polytunnel or comfrey area)**

The vegetable garden will play a key role in providing us with food. It will essentially be run on a raised bed system with 1.2m wide beds and 0.4m wide paths. We are hoping to mulch the paths with wood chippings sourced locally. The beds will be mulched with compost, manure and straw. The beds will be worked in rotation. They will be laid out with the gradient to maximize moisture retention in the soil during the summer. The polytunnel will play an important role in providing year round vegetables. It will be used to grow tomatoes, peppers, cucumbers, aubergines, salad, etc.

We intend to supply our family year round with vegetables. As well as this we would like to be able to supply pasties and quiches to the hub café..

Most of the horticultural and agricultural work will be done by hand. However we will be part of a rotivator machine club (organised by C. Owen of plot 9) and will use this service when need dictates.

The vegetable garden will be grazed by Khaki Campbell ducks in order to minimise slug and snail populations. In winter it is possible that we will use the chickens to go over the garden and reduce pest populations.

### **Table of vegetables produced for home consumption**

Vegetable	January	February	March	April	May	June	July	August	September	October	November	December
Globe Artichoke												
Broad Bean												
French Bean												
Haricot Bean												
Runner Bean												
Beetroot												
Broccoli												
Brussel Sprouts												
Cabbage - spring												
Cabbage - winter												
Carrots												
Cauliflower												
Celery												
Squash												
Cucumber												
Kale												
Leeks												
Salad												
Sweetcorn												
Courgette												
Onion												
Parsnip												
Peas												
Potatoes												
Spinach												
Tomatoes												
Turnips/ Swedes												
processed												
dried												
fresh												
harvest												
In store												



## **Orchard**

### **approx 2250 sqm**

The orchard will play a central role in our holding. It will include plums, apples and pears

We have chosen to grow two top-fruits as cash crops:

We will plant 29 plum trees. The plums will be a combination of varieties planted on a range of rootstocks. We would plan to sell approx 150kg of plums each year, bringing in a total of £600.

We will plant 49 apple trees. There will be a range of apples on a range of rootstocks.

We are aiming to earn £1,200 by year 5 from the sale of apples.

There will be also be 6 pear trees ("winter nelis" on a bush rootstock) for home consumption

## **Nuttery**

### **approx 1700 sqm**

On the western side of the orchard will be the nuttery. We are planning to plant 50 trees, producing 100kg of nuts. These would be sold wholesale for £1000.

The greatest challenge in growing this crop will be squirrels. Their siting has been considered to ensure that squirrel access to the nuttery is difficult (ie any squirrels will need to cross open ground to reach the nuttery).

The orchard and nuttery will be grazed by geese to keep the grass down. Chickens will be introduced to it on occasion when a need for pest control becomes apparent.

## **Soft Fruit area**

### **approx 450 sqm**

Soft fruit will be grown in an area next to the garden. We will grow cherries, raspberries, blackcurrants, redcurrants, gooseberries and rhubarb. 8 cherry trees will be included in this area.

#### **Cherries.**

They will be "Stella" on GM9 rootstock which is a sweet dwarf cherry that will need staking, mulching and netting.

#### **Rhubarb.**

A patch of rhubarb will be grown for seasonal crumbles

#### **Gooseberries and Redcurrants.**

These will be grown principally for bottling.

#### **Blackcurrants.**

These will be principally for juicing.

### **Strawberries.**

For seasonal home consumption.

The only animals to have access to this area will be the chickens which will be used to give the area a “clean up” each winter.

### **Commercial Soft Fruit area approx 500 sqm**

Between the garden and the orchard is an area that has been principally set aside for soft fruit production. The soft fruit area will include blueberries and raspberries.

### **Short Rotation Coppice (SRC)**

The SRC will be planted up using 20/25cm hybrid willow rods. They will be planted using hemp mulch mats to suppress weed competition. They will be planted at 0.6m spacing, in rows 1m wide, with 1.5m between twin rows. There will be an access routes through the SRC to allow for both vehicular access for harvesting and access for the chicken coop. In addition to fuel, the harvest from this crop will also be used for pea/ bean sticks for the garden and other additional craft uses.

### **Long Rotation Coppice (LRC)**

To the west of the house will be an area of new plant woodland. It will be a long term project aimed at providing quality timber for craftwork. As such the first harvest will not occur for 12 years or more. The area will include ash, chestnut, oak and hazel.

There will be an area of elder above the house which will be grown for its fruit.

### **Duck area**

Adjacent to the barn is the duck area. This will act as a holding pen for the ducks before they are allowed into the garden. It will include the duck pond.

### **Geese area**

Adjacent to the barn will be the geese area. It will include a small plantation of Larch trees. These will be grown as a long term project to provide structural timber for building works. The geese area will include the geese pond. This will act as a reservoir for garden irrigation. It will be fed from the rainwater harvest from the turf roof of the house.

This area will act as a holding area before the geese are allotted a grazing

block. For the most part the geese will go on to graze the orchard. At times they will graze the fields.

This area will also contain the entrance to the root cellar.

## **Grazing and Copses**

There are 4 grazing areas on the plot. They will primarily serve the cows. They will be used in rotation. Occasionally we will work with our neighbours (who are planning on keeping sheep) to compliment grazing. We would occasionally bring their sheep in to clear up the fields (subject to standstill periods). The primary grazing block lies between the house and the garden. We will plant a chestnut copse here with a long term view of a possible chestnut harvest. The second grazing area is next to the barn. The third grazing area is to the south of the garden. The fourth grazing area is alongside the trackway on the east of the plot. This area will be grazed occasionally. We have designed this narrow field in this way to create a buffer between the hedgerow and the orchard.

## **House garden**

This garden has been designed to fulfill a variety of purposes. It has been designed to provide food for the house. There will be a herb garden near to the kitchen. The water runoff from the dwelling roof will pass through a watercress bed and into a wildlife pond which has been sited to reflect sunlight into the dwelling. The remainder of the garden will be planted with perennial plants, bushes and trees for various purposes. A few examples are given below:

*Mulberry bushes – fruit*

*Birch trees – sap for wine*

*Maple trees – syrup*

*Blackberry cultivars – berries*

*Wild roses - rosehips*

The garden has also been designed to provide some wind lift for the predominant winds to reduce wind impact on the house. This is mainly achieved with a thick hedge (mixed native species) and careful siting of the trees

### ***A word about hay***

We have chosen to buy in all our hay and straw in an attempt to build up the soil depth and fertility.

## **Value Added Produce**

We plan to explore two “value added produce” initiatives:

We plan to make pasties and quiches from surplus vegetables and sell them in the hub café.

We plan to make bow-topped caravans using timber from the communal woodland.

- **Fuel**

**Fuel**

We intend to supply all our own fuel through Short Rotation Coppice.

Recent field trials in South West Wales

(<http://www.forestry.gov.uk/srcsite/INFD-5KUEVR#zone6site19>) predict an annual harvest for Short Rotation Coppice (SRC) of 7-14 dry tonne per hectare for willow species.

We are planning on planting approximately 3000 sqm (0.3 hectares) of mixed willow SRC. We estimate, this should, once established give us a return of between 2 and 4 dry tonnes of dried seasoned firewood. It will be harvested on a 3-year rotation and stored in the outbuildings. The hedgerows on the plot will provide additional firewood. There will be approximately 440 meters of new plant hedgerow to complement the existing boundary hedgerows. We estimate that these will provide an additional 1-2 tonnes of firewood annually. These will be laid on a 7-year rotation and side-trimmed annually.

- **Soil**

The soil is a sandy acidic loam with a topsoil depth ranging from about 100mm at the top of the site to about 400 mm at the lowest point. Below the topsoil is a shale subsoil.



*Testing the soil depth*

The acidity will be addressed using lime and any possible nutrient deficiencies addressed using Rockdust.

- **Water and Drainage**

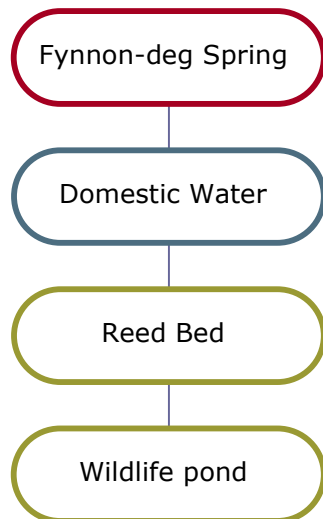
We will use the ffynnon-deg spring for our drinking, cooking and washing water provision. This will be stored in two 50 gallon containers (approx 450 litres) within the house. We estimate that we use between 20 and 40 litres of drinking/ cooking water a day and between 200 and 300 litres a day on washing.

Irrigation for the garden will be supplied with rainwater runoff from the house roof and stored in a series of ponds across the site. The largest water storage facility will be the large geese pond sited above the garden itself. The duck pond will be similarly supplied by the barn roof.

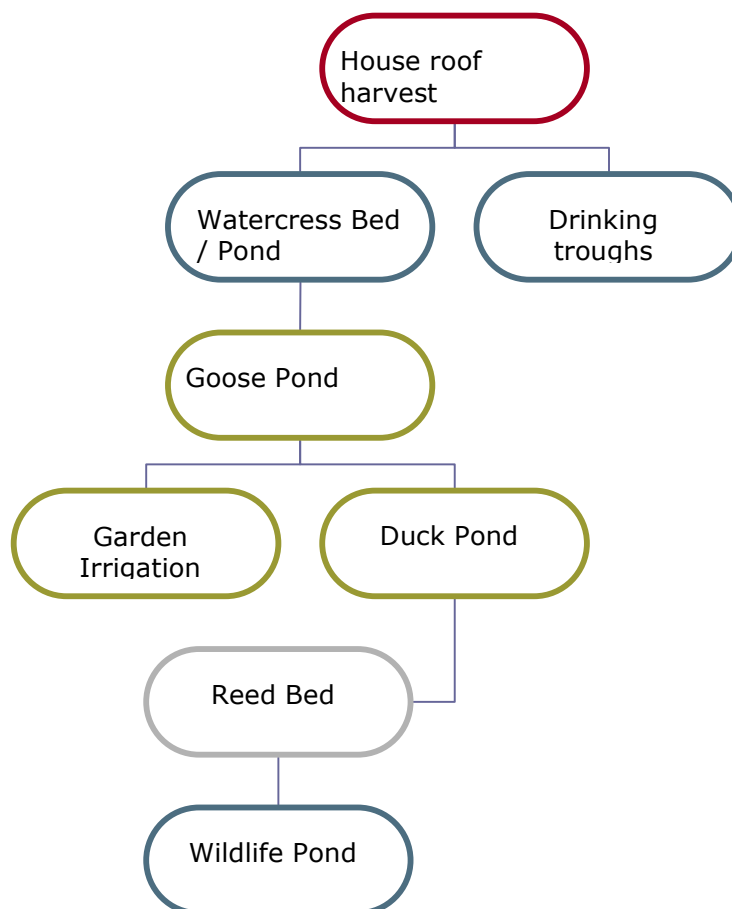
Irrigation for our polytunnel will again be supplied by means of a rainwater harvesting system. There will be a large water storage facility situated at the northern end of the polytunnel. This will be supplied by rainwater from the polytunnel roof. It will be a storage facility of about 6,000 litres. This figure has been arrived at through estimating water use in our current polytunnel and increasing it proportionally. This should be ample to supply the polytunnel through a 4 week dry period.

- **Illustration of the major water routes; (these are all gravity fed)**

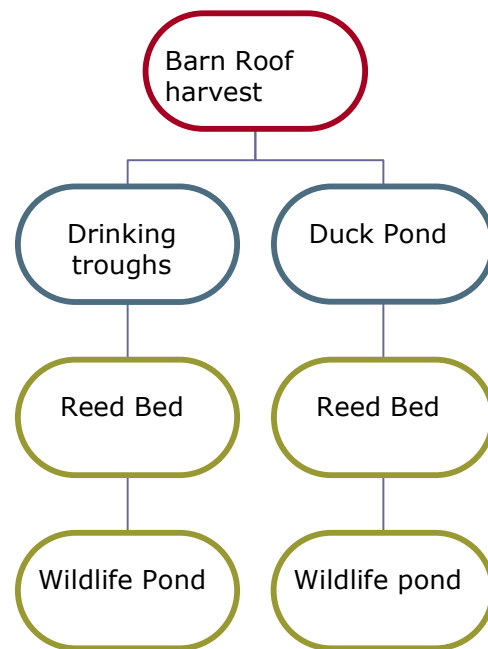
### 1. Spring-water



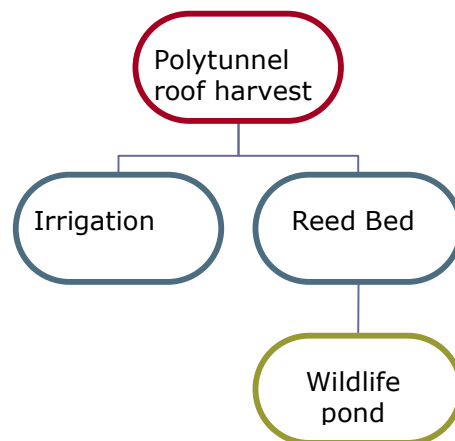
### 2. House Rainwater Harvest



### 3. Barn Rainwater Harvest



### 3. Polytunnel Rainwater Harvest



- **Waste (including siting, storage and processing)**

The main waste processing area will be sited in the outbuildings. Human waste will be composted using a 3-chamber compost toilet. Two of the chambers will be used for solid waste and the third chamber used for urine.

Compost toilets are now a well documented solution to the challenge of sustainable sewage solutions at source. The solid human waste is layered with browns (cardboard, paper, etc) and greens (grass clippings, weeds etc) in a sealed composting chamber where it is contained for a minimum of 12 months. On emptying the resultant compost is effectively safe, inert soil. This will be used on the SRC.

The urine will be composted using straw bales. Research by Peter Harper, Director of Biological Research @ CAT ( [www.cat.org.uk](http://www.cat.org.uk) ) reveals that nitrogens in the urine are neutralised by the carbon content of straw whilst retaining all the minerals, nutrients for use as a mulch. Thus, the straw will be changed fortnightly and used to mulch the SRC.

Kitchen waste will be similarly composted using a dual chamber custom made wormery. The cooked food scraps and raw food scraps being composted by cultivated tiger and earth worms. The resultant compost will be used to mulch the house garden.

Waste water will be processed using a reed bed system. The waste water will come from the bath, the washing machine and the bathroom/ kitchen sink. It will then pass through a series of reed beds planted with bulrush, yellow flag and willow. Any nutrient residue in the waste water will be taken up by these plants. The water will then flow into the wildlife pond. The water in effect being purified before being allowed to return to the natural water courses.

- **Energy Use and Generation**

### **Electricity**

We are intending to connect into the community supply of electricity. We may choose to supplement this with a set of photovoltaic panels should we need to. We are intending to run a washing machine (without a heater element), a fridge, a freezer, laptop, stereo and dvd player.



### **3. Buildings**

Please find attached plans, sections and elevations of buildings.

All buildings will be constructed by Paul, Hoppi and Jarvis. We plan to only bring in employed labour when absolutely necessary (for example to certify the electricians). Paul will do the building/ carpentry. Hoppi will do the plumbing and electricians. The Barn and Polytunnel will have a slightly longer build-time because we will be more engaged with the land by that point.

Construction Periods:

House and Outbuildings: 18 months (6000 hours approx)

Barn and Polytunnel: 9 months (2000 hours approx)

#### **The House**

**(internal floor area = approx 110 sq. meters)**

- **Purpose.** The house has been designed to accommodate a family of five. It includes an office room and a therapy room so that Hoppi can work from home. It has been designed around the kitchen which is considered to be the heart of the house.  
The house has been designed to work with the natural cycles, performing excellently and providing a warm, light and comfortable dwelling.
- **Materials.** The house is essentially a timberframe structure using strawbale as infill. The outbuilding element is a timber-frame studwall construction. Materials are dependant on approval by building regulations.

Element	Material	Reason	Role	Source
Foundations	Recycled Masonry Limecrete	Recycled Environment	Structural Structural	Local/ UK Calc ty Mawr lime, Wales
Floor	Roughsawn Oak Trussed joists Shuttering Ply Straw Floorboards Tiles	Natural Performance Performance Natural Recycled Recycled	Structural Structural Skin Insulation Finish Finish	Lonisaf timber (Welsh hardwoods) Donaldson Timber engineering, (made in UK) Jewsons (made in UK) Local reclaimed recycled
Walls	Larch Frame Straw Bales Lime render Earth plaster Timber window frames Double glazing	From site Natural Environment Natural Local Recycled	Structural Insulation Skin Skin Structural Lighting	Pont-y-gafel Local/ UK Calc ty Mawr lime, Wales Pont-y-gafel Home made using welsh hardwood/ softwood recycled
Roof	Trussed joists Plasterboard Vapour barrier Straw Bales Shuttering Ply Butyl Membrane Turf/ Sedum	Performance Fire retardant Performance Natural Performance Performance From Site	Structural Skin Membrane Insulation Structural Membrane Environmental	Donaldson Timber engineering, (made in UK) Jewsons (made in UK) Jewsons (made in UK) Local/ UK Jewsons (made in UK) LBS (made in UK) Site

- **Construction**

The foundations will be minimal pad footings made from limecrete or concrete (subject to building regulations) and recycled masonry.

A welsh-oak decking frame will support the floor and walls. The floor will be a combination of British shuttering ply (chosen for its rodent deterring ability), trussed joists with straw infill and reclaimed floorboards.

The structural uprights will be local softwood in the round. The walls will be infill straw/ hay bales with an external lime render and an internal earth plaster render.

The roof will be supported by trussed joists. These are lightweight timber I-section beams made from recycled woodchips. We have chosen them for their high performance and environmental specification. They will eliminate the need for a large section timber roof structure. The roof will be insulated with straw/ hay infill. We will use OSB boards either side of the insulative/ structural layer. The internal ceiling will be lined with plasterboard to provide a fire retardant layer. A butyl rubber membrane will provide a waterproof layer for the turf.

The straw will be sourced as locally as possible. We would like to use hay bales (which would be easier to source locally) however we are aware that this, along with other design choices may be influenced by building regulations.

There will be a large area of southern glazing. Windows and doors will be either of softwood (fsc) or local hardwood depending on their aspect. Glazing will be double or triple depending on aspect. The house has been designed to be visually unobtrusive with a low profile and a green roof.

- **Reversibility.**

The building is reversible insofar as the site could be restored to its former condition with relative ease. After dismantling the structure the small masonry elements could be dug up and removed. There would need to be some earthworks to return the site to its previous incline.

- **Passive Solar Design**

The house and outbuildings have been designed to incorporate passive solar gain. The large area of glazing in the living area is meant to capture the sun's light and warmth. Reclaimed slate tiles will be used as flooring in the area around this large window to store the heat gain. Between the living space and the main bedroom there is a narrow corridor with glazing on the south side and a masonry wall on the other. The wall has been placed here and designed as a thermally massive sink for sunny winter days.

A combination of evergreen (ivy) and deciduous (grapevine) plants will be grown along the balcony and timberwork on the south. They will be used to partially screen the sun to avoid overheating in the summer. The roof has a large southern overhang for the same reason.

- **Active Solar Design**

There is an area below the balcony at the front of the house where no climbing plants are planned. This will be used to heat water for domestic use on sunny days. Between the bathroom and cold store there will be a large hot water storage facility to capture and store this heat. In addition to this at the rear of the dwelling will be a 3meter by 3 meter photovoltaic panel array on an automated angled framework.

- **Ventilation and Infiltration**

The house has been designed to minimise infiltration. The main entranceway to the house has been designed as an airlock. The other doors to the house have been incorporated for summer use only (and as emergency fire exits).

Ventilation is provided in all of the living rooms. In many cases this will take the form of stable doors (bedrooms, office and bathrooms).

The layout has been designed to provide some shelter from the south west winds (by means of the spare bedroom and therapy room) whilst still being able to capture solar gain from the south.

- **Natural lighting**

All of the rooms have been designed to be light under ordinary daylight conditions. The rooms that face north have large windows. The cold store is the one possible exception to this. This is because fruit and vegetables are best stored in dark conditions.

- **Space Heating**

The house has been designed to be super-insulated and thus require minimum heating. We are anticipating only needing to heat the house when conditions are cold and overcast. The house will be heated by a thermally massive Russian ceramic woodburner. It will be fired up for an hour a day and then will radiate warmth over the following 23 hours.

- **Thermal Performance**

The house is designed to perform excellently.

<i>Element</i>	<i>Area Msq</i>	<i>U value W/msqK</i>	<i>W/K</i>
Floor	85.6	0.2	17.12
Roof	85.9	0.2	17.18
Walls	83.3	0.2	16.66
Doors	12.9	0.83	10.7
Windows	31.6	2.00	63.2

The total specific heat loss = 124.9 W/K

The Volume of the house will be 274cu.m.

The heat load will be 0.46Watts per cubic meter per degree

### **Outbuildings**

**(approx. 58 sq. meters)**

- **Purpose.**

The outbuildings are integrated into the dwelling and they make provision for the processing of human and food waste as well as the necessary storage provision for fuel and biomass. The outbuildings have been designed to provide an undercover area which can be used to dry clothes and as an extension to the living space in the summer.

The composting area will compost both human and food waste .There will be a straw store (with a capacity for storing 52 bales) next door. The compost toilet will be a standard 3 chamber dry composting facility. Urine will be directed into a third chamber for composting with straw. Kitchen food will be composted in a 2 chamber wormery facility.

The courtyard will include a wood-store which will be used to harvest approximately 5 tonnes (dry weight) of coppice fuel each year and allow for a storage period of approximately 12 months so that the moisture content can be reduced to about 20%. A storage provision of approximately 2 cubic meters per tonne has been made, with a maximum capacity of 8 tonnes fuel.

The outbuildings will be timber framed with timber cladding and will have a tiled roof. The tiles will either be made of recycled car tyres (Though we are having difficulty sourcing these presently) or alternatively recycled masonry dust. This roofing material has been chosen to be relatively lightweight.

The spare bedroom will be included in this area. It has principally been designed for our teenage son. Being a noisy teenager it makes for smoother family relations when there is a bit of distance between us. We do not anticipate that he will be living with us very long and thus this space has been considered as a spare bedroom for visits from our family (some of whom live far away). A therapy room for Hoppi has

been incorporated into this area. Both the bedroom and the therapy room will be heated using a small woodburner. This annex will be insulated with sheeps wool insulation and will incorporate passive solar gain by means of southern glazing and an internal dividing wall of high thermal mass (cob).

The outbuildings courtyard has been designed to embrace the suns warmth while offering some shelter from the south western winds.

- **Materials**

Element	Material	Reason	Role	Source
Foundations	Recycled Masonry Limecrete	Recycled Environment	Structural Structural	Local/ UK Calc ty Mawr lime, Wales
Floor	Rammed Earth	From Site	Finish	Site
Walls	Larch Frame Sheeps wool Timber cladding Gypsum plaster Timber window frames Double glazing	From Site Natural From Site Fire retardant Local Recycled	Structural Insulation Skin Skin Structural Lighting	Pont-y-gafel Local/ UK Site/ Local Jewsons (made in UK) Home made using welsh hardwood/ softwood recycled
Roof	Timber joists Roofing tiles Plasterboard Vapour barrier Shuttering Ply Butyl Membrane Turf/ Sedum	From Site Environment Fire retardant Performance Performance Performance From Site	Structural Skin Finish membrane Structural Membrane Environmental	Site/ Local Recycled product, made in UK Jewsons (made in UK) Jewsons (made in UK) Jewsons (made in UK) Jewsons (made in UK) LBS (made in UK) Site

- **Construction**

The outbuildings will be built using a lightweight timber frame structure and cladding. The composting facility will have a concrete base and walls in accordance with building regulations. This will also ensure the exclusion of rodents.

The Therapy room will be insulated with sheeps wool insulation and will have a turf/ sedum roof. It will be finished with timber cladding.

- **Reversibility**

The building is reversible insofar as the site could be restored to its former condition with relative ease. After dismantling the structure the small masonry elements could be dug up and removed. There would need to be some earthworks to return the site to its previous incline.

## **Barn**

**(Approx 136 sq. meters)**

- **Purpose**

The timber framed turf roof barn has been designed to be as visually low impact as possible whilst providing a workable storage and livestock area.

- A lean-to glasshouse will provide a nursery for young plants in the spring and summer. It will be considerably warmer than the polytunnel with a recycled glass

roof and a slate floor. It will act as a drying space during the autumn and early winter for fruit, vegetables and seed in preparation for storage.

- The workshop/ tool-store will be dual purpose. On the one hand it will house the many handtools needed for the smallholding including handcarts and wheelbarrows. In the quiet winter months it will provide a workshop space for Paul and Hoppi to make bow-top trailers.
- The food storage room will act as a store for both animal feeds and agricultural/ horticultural harvest (for example hazelnuts, pumpkins, onions)
- There will be a dairy room. This will be used to process the cows milk and as a space for making cheese/ butter/ yoghurt.
- The straw/ hay store has been designed to accommodate 150 bales of hay (to supplement 2 cows through the winter; 1 bale of hay per day for 5 months of the year) and 112 bales straw:
  - bedding for cows – 2 bales per week for 5 months = 40 bales
  - bedding for geese – 1 bale every 8 days = 42 bales
  - bedding for ducks – 1 bale per month = 12 bales
  - mulch for raspberries = 20 bales
 We estimate that we will need 22 sq. meters to accommodate all this.
- The cow area will be divided into 3 sections –
  - One section will be used for milking on a daily basis.
  - The main area will house the cows during wet winter weather. This area will be connected to the outdoor exercise yard.
  - A third area will be used to separate the calves.
- There will also be the goose area within the barn. The geese will be housed at night to protect from predators (principally foxes).

These areas will be connected by an undercover corridor which will overlook the duck area and garden.

#### • Materials

Element	Material	Reason	Role	Source
Foundations	Limecrete	Environmental	Structural	Calc ty mawr
Floor	Earth	Livestock floor - on site	Floor	Site
	Timber	Raised floor - damproofing	Structural	Site/ local
Walls	Timber frame	From site	Structural	Site/ local
	Timber cladding	From site	Skin	Site/ local
Roof	Timber truss	From site	Structural	Site/ local
	Shuttering ply	Performance	Structural	Jewsons (made in UK)
	Butyl membrane	Performance	Membrane	LBS (made in UK)
	Turf	From site	Environmental	On site
Greenhouse	Glass	Recycled	Lighting	Recycled

#### • Construction

The barn will be a timber frame (150mm by 75mm) structure set upon masonry pads. As much as possible it will use timber sourced from the site. Onto the frame will sit home made trusses which will support a turf roof. The cladding for the cow area will be interspaced vertical slats to allow for good ventilation for the cows. In the areas of the barn which do not have a raised floor, a limecrete/ recycled masonry mix will be used in between the structural pads to provide a weatherproof skirt to the livestock areas.

Rainwater runoff from half of the roof will be directed towards the duckpond. The runoff from the other half will be directed toward two drinking troughs.

- **Reversibility**

The barn will be easily reversible as a structure, requiring little in the way of foundations or earthworks.

### **Polytunnel (110 sqm)**

- **Purpose**

The polytunnel has been designed to house 3, 1.2 meter beds with 2 narrow paths. The 4.2m by 26m polytunnel will be designed to incorporate a rainwater harvest and storage facility. The total rainwater yield is calculated to be 85cu.m per year. We am planning to store 6,000 litres of water for irrigation. It will be stored in a timber frame construction lined with a butyl rubber membrane. This structure will be insulated on 5 sides, and lined with wood on the southern side. It will be connected to a solar water heater within the polytunnel. The idea is that during the day the water will warm up and during the night this warmth will slowly be released into the polytunnel. There will be a small pond in the polytunnel for amphibians.

- **Materials**

The Polytunnel frame will be made using larch from the site. It will be covered with polythene. There will be minimum limecrete pad foundations.

- **Construction**

The Polytunnel will be constructed specifically to enable a rainwater harvest.

- **Reversibility**

The polytunnel, being a lightweight agricultural structure using minimum foundations will be highly reversible.

### **Root Cellar (40 sqm)**

- **Purpose**

Some vegetables need dry conditions for storage (onions and pumpkins for example). Some vegetables require cold humid conditions for optimum storage (carrots and potatoes for example). The root-cellar will provide us with a humid cold-store for our vegetable and fruit harvest. It will play a crucial part in the storage of our apple harvest and will enable us to effectively extend the apple season considerably. It will be a well-ventilated space which will be kept at a high humidity. This will be achieved by essentially creating an earth cave.

- **Materials**

The root-cellar will be made simply using excavated materials from the site. The 3 additional elements will be rot-proof sacks, a waterproof membrane and a little cement. There will also be a timber doorway and a couple of ventilation pipes.

- **Construction**

Subsoil from an excavated hole will be mixed with 5% cement and loaded into rot-proof sacks to create a building block with which to build walls and an arched roof. This technique is known as stabilized earth building. The structure will be covered with a waterproof membrane which will direct rainwater towards french-drains. The French-drains will be built using the large aggregate found during the excavations.

- **Reversibility**

The root-cellar, being essentially an earth cave will be easily reversible.

### **Duckhouse**

- **Purpose**

This building will house the ducks at night and provide a refuge from predators.

- **Materials**

The duckhouse will be built using leftover materials from the construction of the house and barns.

- **Construction**

The duckhouse will be mounted on stilts and will be a timber structure made from 75mm by 50mm roughsawn timber and clad in offcuts. It will have a thatch roof. It will be approximately 2m by 1m and stand no higher than 1.5m from the ground.

- **Reversibility**

The duckhouse, being a very small lightweight timber structure will have a minimal footprint on the land.

### **Chicken Coop**

- **Purpose**

A purpose made mobile chicken coop will be used to house the chickens at night. It will be rodent and fox proof. It will essentially be a small low garden shed on wheels. It will be moved around the site appropriately.

- **Materials**

It will be made primarily from off-cuts produced during the major building works. The roof will be lined with roofing felt for a lightweight finish.

- **Construction**

The coop will be constructed using a 50mm by 50mm rough-sawn timber frame and clad in off-cuts. It will use high grade chicken wire to ensure rodent proofing. It will be mounted on four lightweight wheels and will be designed to be moveable by one person.

- **Reversibility**

This building will leave no footprint on the earth.



## **4. Business Plan for land based produce**

We would like to emphasize at this point that flexibility and adaptability will be key to the success of our land-based enterprises. We have very deliberately chosen a number of enterprises for our plot in an attempt to have plenty of options to fall back on should one crop fail. Similarly should one crop perform excellently we will expand that aspect of the business.

### **Hazelnuts**



On the western side of the orchard will be the nuttery. The conditions and climate in North Pembrokeshire are perfect for hazelnuts. Hazelnuts prefer a slightly acid soil and this combined with a southern aspect and good rainfall imply that the site is a good one for hazelnuts. The hazelnuts have been sited to shelter the fruit trees from the western winds.

We have targeted hazelnuts as a cash crop. Currently the UK imports 90% of its hazelnuts. Organic hazelnuts retail at £4 for 250g. The wholesale price is £10 a kilogram. (source; *Aardvarks whole-food shop in Carmarthen*)

The trees will be spaced at 4m centres with 5m gaps between rows. Half will be "Pearsons Prolific" and half "Kentish Cobb". Cropping will only begin in earnest after 5 – 7 years. Cropping is often biennial. However it averages out at between 3 – 5 kilos per tree. After shelling one would expect to harvest an average of about 2kg of nuts per tree. We are planning to plant 50 trees, producing 100kg of nuts. These would be sold wholesale for £1000. We would hope to use some volunteer labour to assist us with this harvest. We will purchase a shelling machine.

I would not expect a significant harvest from the hazelnuts until year 5.

Capital; costs:- (Trees, 50 @ £10 each, £500 (for 3 yr old trees. Source, *Cool Temperate, Notts*), Shelling Machine, £500)

## Soil preparation

Soil Preparation. Course screened limestone will be rotivated into the soil at a rate of 10.5 tonnes per hectare (as advised by the Agricultural Lime Association) in order to neutralize the soil. Rockdust will also be applied (to replenish trace mineral deficiencies) at a rate of 5 tonnes per hectare. The cost of lime is estimated to be £40 a tonne (*inc VAT, delivery and spreading costs, source-Clunderwen and Cardiganshire Farmers Ltd*).

The cost of Rockdust is estimated to be £300 a tonne (*inc VAT and delivery. Angus horticulture*)

We have been advised that to employ a local farmer with tractor for the day is in the region of £250. We imagine we would employ a local farmer one day to rotivate and spread (rockdust) and another day to harrow and roll.

These costs have been divided proportionally amongst the various areas requiring these services.

Thus the 1700 m<sup>2</sup> Nuttery would require:

### Set up Costs

	Quantity	Cost (£)
Limestone	1.8 tonne	72
Rockdust	0.85 tonne	255
Spreading/ Rotivation costs	30%	75
Reseeding	30kg forage rye*	18
Harrowing/ Rolling	50%	125
Hazels	50 bushes	500
Shelling machine		500
Total		1495

\* 180 kg per hectare, £0.6 per kg

## Marketing

I would aim to sell 100 bags of the best of the harvest direct to the customer at £1.50 per 100g (£15.00 per kilo). We would do this using the Lammas logo. We would do this through farmers markets, and the trading post.

I would sell the rest wholesale at £10 per kilo. The primary market for the

hazelnuts would be Wholefood shops and distributors in Wales (for example *Good Food distributors, Llandrindod Wells*). We would also explore wholesaling to Matthew and Chris' organic fruit and veg supplies

## Sales

	Harvest Weight kg	Wholesale kg	Income £	Direct to customer kg	Income £	Total Income £
Harvest	100	90	900	10	150	1050

## Running Costs (Annual)

Item	Cost (£)
100 bags	20
Distribution costs	80
Total	100

Hazels	Average Harvest (kg)	Income (£)	Running costs (£)	Payback on outlay (10%)	Profit (£)
Year 3	0	0	0	0	0
Year 4	0	0	0	0	0
Year 5	50	550	100	150	300
Year 6	100	1050	100	150	800

Thus we would expect an average income of £1050 per year, minus running costs brings that to £950. If we account for 10% payback on the initial outlay (£150, we would expect an average profit of £800 per year once established).

## Plums



We will plant 29 plum trees in an area totaling 650 m<sup>2</sup>. The plums will be a combination of (depending on availability) “Marjories Seedling”, “Persshore”, and “Opal”, with 14 on pixie and 15 on St. Julien rootstock. The plums with pixie rootstock will be planted in a 3m spaced configuration and those on St. Julien rootstock will be planted at 5m centres. They will all be staked and mulched with geotextile to begin with and then with organic mulch periodically.

The soil conditions are currently a little too acid for plums and so we would introduce lime to begin with and take care to use neutral/ slightly alkaline mulch mixes. The manure would be added as a dressing to avoid contact with lime.

One of the reasons for growing a variety of plums is to spread the harvest season out, and thus make distribution and sales a little easier. Harvest will take place from late July to late September.

The planting methodology would be similar to that of the hazels and apples. Course ground limestone and Rockdust would be rotivated into the soil. The soil would then be harrowed and reseeded. After standing for a few months, the trees would be planted by hand and individually mulched (and staked).

### **Set-up costs**

	Quantity	Cost (£)
Limestone	0.7 tonne	27
Rockdust	0.3 tonne	90
Spreading/ Rotivation costs	11%	28
Reseeding	12kg forage rye	7
Harrowing/ Rolling	15%	38
Plum Trees	29	290
posts		29
Manure		100
Total		609

#### Running Costs

Boxes	20
Distribution	20
Total	40

Due to the altitude and climate we have been very conservative with our estimated yields. We would expect a harvest of about 7kg per tree each year for those with pixy rootstock (98kg) and 13kg a year for those on a St. Julien rootstock (195kg). These estimates are very conservative due to the climate and altitude of the site.

Of the harvest we would expect 50% to be retail grade, 25% to be for juicing and the remaining 25% to be for home consumption/ home juicing.

Of the 148kg year 5 harvest we would expect to have approximately 74kg of retail-grade plums. We would sell these wholesale at £4 per kilo. We would have approximately 37 kg of juicing grade plums. These would be directed toward the hub café and sold for £3 kilo.

We would not expect the plum trees on more vigorous rootstocks to come into full production until beyond year 5.

Harvest	Year 1	Year 2	Year 3	Year 4	Year 5
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14 on Pixy rootstock, kg	Planting out	0	24	49	98
15 on St Julien rootstock, kg	Planting out	0	0	0	50
Total Harvest, kg			24	49	148
Retail Quality, kg			12	25	74
Income, £			48	100	296
Juicing, kg			6	12	37
Income, £			18	36	111
Total income, £			66	136	407
Running costs			10	20	40
Payback of initial investment				61	61
Profit, £			56	55	306

*Patrick Whitefield suggests a yield of 15 – 25 kg on st julien rootstock and 9 – 15 kg on pixy rootstock*

### **Marketing:**

We would aim to sell to the local organic vegibox suppliers, Matthew and Chris Young Organic Fruit and Veg supplies in Hebron. Initial discussions have confirmed that they have difficulty sourcing local organic fruit.

We would also expect to sell some fruit on the Lammas market stall and some fruit through the Lammas trading post.

In addition we would sell fruit for juicing to the hub café.

Should we still have surplus fruit to sell we would arrange to sell it through alternative organic fruit suppliers such as “Aardvarks” in Carmarthen and “Wholefoods of Newport”.

“Organics to go” in Llandeilo have also expressed an interest in buying fruit from us. They already run a delivery service in the area and would be able to collect.

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## **Apples**



We will plant 49 apple trees on 1600m<sup>2</sup>. There will be a range of apples on a range of rootstocks from semi-dwarf to standard. (M26, MM106 and M25) They will be selected for hardiness. They will all be staked. We will grow a variety of apples including “Ashmeads Kernel”, “Bramleys Seeding” and “Newton Wonder”. Local smallholder Mike Foxwell has a young apple orchard in conditions very similar to those in our plot. He has planted a variety of apples and is researching those varieties which work best in that particular climate. His research has influenced and will continue to influence our choice of variety.

Soil preparation is as with hazels and plums

#### Set up Costs

	Quantity	Cost (£)
Limestone	1.7 tonne	67
Rockdust	0.8 tonne	240
Spreading/ Rotivation costs	30%	75
Reseeding	30kg forage rye	18
Harrowing/ Rolling	35%	87
Apple trees	49	490
posts		49
Manure		200
Total		1226

#### Running Costs

Boxes	20
Distribution	20
Total	40

The soil will need lime and manure digging in to improve it sufficiently for the apples. The figures for harvest which we have used are at the lower end of the scale due to the altitude and climate conditions.

We would expect the dwarf varieties to produce approx 20kg each (24 @ 20kg = 480 kg).

We would expect the semi-dwarfing stock to produce about 30kg each (though these won't reach maturity for 5-6 years, 18 @ 30kg = 540kg)

We would expect the standards to produce about 80kg per tree (though these won't reach maturity for 7-8 years, hence we will not even bring these into the calculations.)

	Year 1	Year 2	Year 3	Year 4	Year 5
Dwarf		180kg	360kg	480kg	480kg
semi dwarf			120kg	240kg	360kg
Standard					120kg
Harvest		180	480	720	960
Retail Quality		90	240	360	480
Income		180	480	720	960
Juice Quality		45	120	180	240
Income		68	180	270	360
Total income		248	660	990	1320
Running costs		40	40	40	40



Set up payback				123	123
Income		208	620	827	1157

So by year 3 we would expect to be producing 480kg of apples of which we would expect 240kg to be retail-grade. We would aim to sell these at £2 a kilo. We would expect 120kg to be juice grade. We would sell these for £1.50 a kilo. This would bring in an annual return of £660.

### **Marketing:**

We would aim to sell to the local organic vegibox suppliers, Matthew and Chris Young Organic Fruit and Veg supplies in Hebron. Initial discussions have confirmed that they have difficulty sourcing local organic fruit.

We would also expect to sell some fruit on the Lammas market stall and some fruit through the Lammas trading post.

In addition we would sell fruit for juicing to the hub café.

Should we still have surplus fruit to sell we would arrange to sell it through alternative organic fruit suppliers such as “Aardvarks” in Carmarthen and “Wholefoods of Newport”.

“Organics to go” in Llandeilo have also expressed an interest in buying fruit from us. They already run a delivery service in the area and would be able to collect.

The apple varieties have been selected to spread the harvest season for ease of marketing.

The root-cellar will enable us to store some of our apple harvest for sale into the winter when the availability of Welsh Organic apples is low.

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## **Blueberries**



The blueberry area is approximately 250 sqm (20m by 12.5m).

North American highbush blueberries (cultivars of *Vaccinium corymbosum*) are mainly deciduous shrubs 1-2m (3-6 ft) in height. They like an open, sunny, sheltered position and good drainage is essential.

Currently most blueberries are imported in the UK.

The soil is perfect for blueberries and we plan to improve the drainage (blueberries like very good drainage) by skimming the topsoil from the paths which will run perpendicular to the contours. The topsoil will be added to the raspberry beds.

An acid soil is essential (pH 4.5-5.5) for blueberries. The soil survey indicates that this area (area 6/15) has an acidity between 4.6 and 5.3. Acid sand and peat soils are the natural habitat of wild *Vaccinium* species.

We do plan to rotivate in rockdust to increase the trace mineral availability in the soil. In the long term we will be careful to maintain the acidity of the soil. Softwood woodchip/ sawmill dust from the communal woodland will therefore be used as a mulch.

The bushes will be planted in the winter at 1.5 meter spacings. There will be no pruning required for the first three years. Thereafter pruning will take place every winter. In the first 5 years the plants are only lightly pruned and after they are mature, it is normal to take out about 25-30% of the wood each winter in order to leave strong healthy branches that are capable of sustaining larger fruit.

We will plant a range of late flowering cultivars for optimum pollination and yield.

The blueberries will be picked in stages, as they ripen, from late summer to early autumn. Fruit in the same cluster may ripen at different times, and four or five pickings may be necessary over the course of the harvest. Each plant generally provides 2-5kg (4.5-11lb) of fruit. (Source – Royal Horticultural Society)

Blueberries are picked by rolling the berries between the forefinger and thumb to remove them from their stalks. They should come off easily, and feel soft to the touch. Fruit generally turns blue and then develops a white surface bloom over a period of a few days. It is only then that they are ready for picking.

Blueberries have excellent keeping qualities, keeping fresh in the fridge for at least a week.

Blueberries are usually trouble free in the UK. Birds are the main pests, and bushes will need the protection of a fruit cage, or nylon netting stretched over a wooden frame.

A 6ft high wooden post and rail arrangement will be installed around the blueberry patch to create a 20m by 12m fruit cage. The sides of the fruit cage will be secured with small gage chicken wire. Across the roof bird netting will be hung

from late summer to early autumn. We would purchase heavy duty netting which could be re-used for many years in a row. The netting will be kept taught using occasional tripods to lift the netting. This cage will allow sufficient room for the blueberries to be harvested from within. There would be 7 rows with 12 bushes per row, making a total of 84 bushes. Thus the harvest once bushes have matured would be between 168 and 420 kg of fruit. Assuming 25% fail to make the grade (and would thus be used for home juicing), The harvest would be between 126 and 315 kg.

We will buy the bushes young to reduce initial outlay costs. We would not expect an appreciable harvest until year 4 and would estimate that to be 50% of the mature harvest (which we would expect to meet by year 5)

Blueberries can be propagated from cuttings. There is thus potentially a market for blueberry bushes once the crop has established itself.

It will be 3 years before picking becomes economically viable. We would buy 2 year old bushes in order to get the quickest headstart we could without the costs becoming too high. We have based my estimates on a two year old bush costing £7.

*Garden Oasis advertise bushes (30 – 40 cm high) at £15 for 2 (2 years old)*

*Buckingham nurseries are 3.99 each (5 varieties) (1 year old)*

*Deacons Nusery have a huge range at £13.95 each (3 years old)*

*An 12m by 100m roll of heavy duty bird netting costs £675 from Harrod Horticultural.*

### **Set up Costs**

	Quantity	Cost (£)
Rockdust	0.13 tonne	28
Spreading/ Rotivation costs	4%	11
Blueberries	90 Bushes	630
	Netting	675
	Posts	200
Total		1544

## Marketing

We have based my prices on the only retailer for organic blueberries in the UK; Abel and Cole £2.50 per 150 grams (£16.66 per kilo)

We would aim to sell 200 punnets of the cream of the harvest direct to the customer at £2.50 per 200g (£12.50 per kilo). We would market this using the Lammas logo. We would do this through farmers markets, and the trading post. We would sell the rest wholesale at £8 per kilo. We would do this through Matthew and Chris' organic fruit and veg supplies and through the hub café (possibly to be sold as blueberry juice).

## Sales

	Harvest Weight kg	Wholesale kg	Income £	Direct to customer kg	Income £	Total Income £
Good harvest	126	86	688	40	500	1188
Poor harvest	315	275	2200	40	500	2700
Average	221	361	1444	40	500	1944

If we then take these average figures to arrive at a year by year estimate:

Blueberries	Average Harvest (kg)	Income (£)	Running costs (£)	Payback on outlay (10%)	Profit (£)
Year 3	0	0	0	0	0
Year 4	110	972	130	154	688
Year 5	221	1944	180	154	1610
Year 6	221	1944	180	154	1610

## Running Costs (Annual)

Item	Cost (£)
200 punnets	100
Distribution costs	80
Total	180

Thus if we average the income to £1944 per year, minus running costs brings

that to £1764. If we account for 10% payback on the initial outlay (£124). We would expect an average profit of £1640 per year.

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## Raspberries



The raspberry area is approximately 250 square meters (20m by 12.5 m). Again this soft fruit has been chosen because of its suitability for cool wet summers. In addition to this late frosts are not a problem for raspberries.

Most raspberries in Wales are currently imported from Scotland.

Raspberry plants hate wet feet, and they are gross feeders. We plan to address these two critical points by building a raised bed system, building up the soil in the beds using the soil from the paths and increasing the drainage at the same time. We will also rotivate manure in. In addition we will also add lime to create a soil pH of around 6.0.

The rows will be spaced at 2m centres. Thus we would have a total of about 100 meters of raspberry bed.

We will select a range of varieties including both summer fruiting and autumn fruiting croppers. Thus we anticipate the harvest beginning in early July and continuing through to October. Toward this end late varieties of summer fruiters will be selected in order to extend their season well into August (rather than peaking in July). Different varieties will be kept in different rows because the different varieties will have different pruning regimes.

We will use a post and wire system for support, fully expecting to use the same plants and ground for about 8 years before rotating the crop. The posts will be set at 2.4m centres and the paths will be regularly scythed.

We do not plan to net the raspberry crop. My experience in growing raspberries has shown that whilst there are some losses to birds, this is a relatively small proportion of the crop.

We plan to mulch the raspberries with manure from the cow shed.

We will plant the canes at 50cm spacings.

Marshalls sell 12 plants for about £16 (depends on variety). For such a large order we would expect to pay about £1 a plant.

Set-up costs:

	Quantity	Cost (£)
Lime	0.26 tonne	10
Rockdust	0.13 tonne	38
Spreading/ Rotivation costs	4%	11
Manure/ Straw		100
Raspberries	200 plants	200
	Posts and wire	80
Total		439

Summer fruiting raspberries are much more prolific than their autumn fruiting counterparts. We would expect a harvest along the lines of:

	Summer fruiting Kg per m	Autumn fruiting Kg per m	Total Harvest
July	1.0		50kg
August	1.0		50kg
September		0.5	25kg

October		0.2	10kg
Total	2.0	0.7	135kg

We have based this table on figures on the most conservative estimates we could find:

*yields quoted in "the fruit expert" book by Dr Hessayon:*

*Average yield – Summer fruiting raspberry, 4.5lb per yqrd of row (2kg)*

*Average yield – Autumn fruiting raspberry, 1.5lb per yqrd of row (0.7 kg)*

*The Marshall Cavendish handbook quotes 4 – 7.5kg per meter of row*

*Sally Taylor suggests an average yield of 1kg per meter.*

*Patrick Whitefield suggests 2-3kg per meter of row.*

*The SCRI research centre suggests yields of between 4 and 6 tonne per hectare, depending on variety. This would work out at a total yield of between 100kg and 150kg*

We would plan to sell my entire crop to the hub café for juicing. We would pick the raspberries fresh in the morning and take the crop to the café where it would be stored and juiced on demand. Any fruit not used would be refrigerated and used the following day.

Organic Raspberries currently sell for about £8.80 per kilo retail (source, Carrob Growers, Monmouth). We would plan to sell my raspberries for £6 per kilo.

Because the fruit is being used for juicing, it does not need to be picture perfect. If we count for a 10% loss due to birds or fruit not being used, we are considering a harvest of 122kg.

Thus we would plan to sell 122 kg for £6 per kilo, bringing in £732.

There would be no running costs.

If we put aside 10% to cover the initial investment (from year 4 onwards) we would expect an income of £693 per year.

Raspberries	year	Average Harvest (kg)	Income (£)	Running costs (£)	Payback on outlay (10%)	Profit (£)
	Year 3	61	366	0	0	366
	Year 4	122	732	0	44	688
	Year 5	122	732	0	44	688
	Year 6	122	732	0	44	688

I would prepare the ground in year 1 by applying a dressing of manure and cardboard/ straw mulch. We would plant the raspberries in year 2 and expect the harvest to begin in year 3.

#### **Organic Certification.**

We will not apply for organic certification. Rather we will rely upon the Lammas brandname to sell our produce.

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#### **Annual profit for fruit and nuts**

	Hazels	Apples	Plums	Raspberries	Blueberries	Total
Year 1						
Year 2		208				208
Year 3		620	56	366		1042
Year 4		827	55	688	688	2258
Year 5	300	1157	306	688	1610	4061

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#### **Plans for Bow-Top Caravans**





Example bow top caravan

There is an additional enterprise based on timber from the communal woodland. From year 4 onwards we plan to build one bow-top caravan each winter. The reason that this enterprise will not begin until year 4 is simply that we will be too busy setting up the land until that point.

This enterprise has been designed to make full use of the quiet winter months.

### Market

There has always been a healthy market for horse drawn caravans. In recent years the demand for these has far outweighed supply, resulting in increased prices and profit margins for the craftsmen involved. There has been a recent innovative twist in the story of the gypsy caravan. Entrepreneurs have begun to build the stylish caravans on car trailers rather than the traditional horse-drawn flatbeds. This has involved some design changes regarding weight and the nature of the fixings involved but essentially the approach is still the same. The new bow-top trailers sell very well for between £1500 and £6000 depending on the size, quality and level of detail. There seem to be two main markets for such trailers.

- **Internet.** Increasingly trailers and caravans are successfully advertised and sold on the web. Many of the craftspeople have their own websites (for example Nick Dow's bow-tops). Other websites incorporate individual craftspeople's work alongside other caravans for sale (for example Ingham and Fallon). There are also websites dedicated to advertising and selling gypsy caravans (for example, Gypsy Waggon.co.uk).
- **Festivals.** The festivals have always been a place where gypsy caravans have been bought and sold. Particularly the Big Green Gathering and other horse-friendly festivals.
- **Gypsy Fairs.** Gypsy gatherings such as Appleby along with the big horse auctions (such as Reading) have always seen wagons bought and sold.

## **Our Approach**

We will use the following marketing approach:

Having fixed a price:

1. Our first avenue will be to sell the caravan through the Lammas website.
2. Our second avenue will be by putting up adverts in the community hub and other local centres (for example The Queens Hall in Narberth).
3. Thirdly we will put occasional adverts in magazines (for example Caravan magazine)
4. If we still haven't sold the caravan by the summer we will take it with us to the Big Green Gathering and sell it there.

## **Method**

We would purchase a trailer in November/ December and park it in the workshop. The workshop has been designed to accommodate a trailer and allow working room around it. Timber will be logged from the communal woodland and rough-sawn before being stored in the workshop until ready for use. It will then be taken to Kit Owens workshop on plot 9 for fine milling and planning. We will offer an exchange in skilled labour for these services.

The rest of the work will be largely done using hand tools. The bow-top will be finished in felt and canvas.

We will then begin to advertise its sale. We would expect to sell the caravan in the summer months and would store it in the workshop until such time that it sold.

## **Research**

We have purchased a book on gypsy trailers and a set of plans for a bow-top trailer. In addition we plan to buy two bow-top trailers (one large, one small) as temporary accommodation. (These we will sell on when we have finished with them)

## **Timber**

We would aim to use a combination of Ash and Larch to build the wagons. We estimate that we will need approximately 0.7 cubic meters of ash and 0.5 cubic meters of larch (as timber-in-the-round) for a medium sized caravan. We would expect that our share of the produce from the communal woodland will cover this. Because the Larch will be harvested at 5-yearly intervals we will store sufficient timber to provide us with 5 years resources. Should we require more than our share we will simply negotiate with one of the plot-holders who has no plans to use their share of woodland produce.

## **Other Materials**

Our main expense will be in purchasing a trailer base for the caravan. Having

looked at various suppliers (Ifor Williams, Trident, etc) we estimate that we would need to spend £1000 on a medium sized trailer of good enough quality. A couple of examples are given below:

Anssems PSX 1300 SA (2500 by 1530), £1444 (inc vat)

Bravo 260B (2576 by 1426), £1509 (inc vat)

Brenderup 2260 P (2580 by 1533), £1528 (inc vat)

The other costs involved are fairly minimal and estimated below:

Item	Cost £	
Trailer	1500	
Fixings	250	Screws, nails, ironmongery, glue
Felt	126	£7 running meter
Canvas	72	£4 running meter
Woodburner	220	Small gas-bottle top-loading burner with flue pipe
Glazing	30	
Sawmill hire/ workshop fees	200	Using workshop in plot 9
<b>Total</b>	<b>2398</b>	

We would plan to sell our first caravan at a £400 profit. It would thus sell for £2800. This would be a very good price for a medium sized bow-top trailer. Each year thereafter as we become more accomplished, skilled and quicker at making the caravans we would expect bigger profit margins.

### **Experience**

Paul, having been involved with working horses both in tipi valley and at Brithdir Mawr is very familiar with the horse-drawn flatbed trailer market. Indeed he has been involved in buying, selling, commissioning and repairing them. To date he has not built a bow-top caravan but has all the necessary skills and tools to do so. Hoppi is very skilled at decorative painting and pyrography techniques and will also manage the sewing work involved.

## **Plans for Cooked Food**



Example pasties



and quiche

Our holding will create a surplus of eggs. Currently 3 ducks supply all our families egg needs. We are planning on keeping 8 ducks and 8 chickens.

Similarly our holding will create a surplus of vegetables. In our experience the nature of vegetable gardening creates inevitable surpluses in particular crops.

We plan to bake vegetable pasties and quiches for the Community Hub café with this surplus produce during the summer months.

Whether we bake pasties or quiches will depend on the availability of eggs from the holding.

From May 1<sup>st</sup> to October 31<sup>st</sup>, on Friday mornings we will do a bake in the community hub kitchen. We will bake 24 pasties/ quiches for sale over the Friday and Saturday. We will charge £1.65 per pasty/ quiche. The café Manager may choose to levy a charge on top of this.

*Prices for organic pasties and quiches in Aardvarks Wholefood shop, (Carmarthen) begin at £1.80.*

#### Running Costs per week

	Quantity	Cost
Flour	1200g	1.00
Salt	tablespoon	0.10
Butter	600g	2.50
Total		3.60

The Lammas Business Plan estimates between 248 and 581 people will visit in the summer months (May to October). Therefore it is expecting at least 62 visitors a week. It is expected that Friday and Saturday will be the busier days and that is why we will target our products to be available on those days.

There will be no set-up costs because we already own all the necessary cooking equipment, and the hub will provide the other necessary cooking equipment.

We will begin this side of the business in year 5 when the holding has been fully established and the garden is in full production.

## **Plans for Land-based produce – self reliance**

### **Soil Preparation**

The garden area including soft fruit for home production, is about 1250 m<sup>2</sup>. The soil will have lime and rockdust added to it, and then be heavily mulched with straw until ready for use.

	Quantity	Cost (£)
Limestone	1.3 tonne	52
Rockdust	0.63 tonne	188
Spreading/ Rotivation costs	22%	55
Straw Mulch	5 tonne	200
Total		495

### **Livestock**

We plan to keep a range of livestock to assist us in producing a high proportion of our own food from the plot. All the livestock we keep will be principally kept for their produce in the smallholding. They will all play a secondary role in producing livestock for sale. Toward this end it is planned that they will pay for their own upkeep whilst providing our household with a supply of meat, dairy and egg products.

When selling livestock we will target the smallholding livestock market. We will advertise both through the Lammas website and also by putting up postcard adverts in the community hub and local farm shops. Should we fail to sell particular livestock in this way we will take them to local livestock auctions.

The running costs for the various livestock have been incorporated into the "food grown" section because the primary purpose of these animals is to provide food (milk, eggs, meat) for ourselves or services for the land (manure, undergrazing, pest control, etc).

**Dexter Cattle:** We are planning on keeping two Dexter cows. They will be both put to calf every year (using Artificial Insemination, AI). The heifers will be sold at between 6 and 9 months old as house cows. Assuming that each year we get one heifer and one bull calf, we aim to raise £250 per year through the sale of these (after transport costs). We are anticipating selling any bull calves to Mr C. Owen of plot 9 for his meat/ sausage business. The bulls will be sold at 6 months. We would sell them at a reduced rate largely due to convenience.

I would feed the cows a mix of fodder from the garden, hay and concentrates (estimated at 2kg per cow per day).

*(A nearby farmer, David Phillips from Login has offered the services of his dexter bull free of charge, though pre-tb movement tests and standstill orders question the viability of this as an option over AI)*

**Geese:** We are planning to keep two breeding pairs of Brecon Buff geese. We will aim to raise sixteen goslings each year (both geese sitting on a brood of at least 8 eggs). We will sell the geese on as point of lay geese. The remaining ganders will be table birds for our own consumption. Paul has been attending the Llandeilo poultry auction regularly over the past few years and estimates that a Brecon Buff goose at point of lay (p.o.l.) would sell for between £20 and £30. Sales of geese, 8 p.o.l. @£25 = £200.

**Khaki Campbell Ducks:** We are planning on keeping about 8 Khaki Campbell ducks and one drake. We will use the chickens to sit on the duck eggs. In my experience (having kept Khaki Campbell ducks in West Wales for over 8 years) there is a healthy demand for these. We will aim to sell at least 10 ducks a year at £6 each, and raise £60.

**Ixworth Chickens:** We are planning on keeping a flock of about 8 hens with 1 cockerel. There is a healthy market for rarebreed chickens amongst smallholders. Largely they seemed to be sold through advertising in the smallholding magazines. Upon personal enquiry it seems that there is a great demand for Ixworth in particular because they are both practical and pretty birds to keep. Sales of Ixworth hens and cockerals, 10 p.o.l. @ £5 = £50

#### Set-up costs

*Not including basic infrastructure outlay (eg barns, hedging, fencing)*

Item	Cost £
Cows	400
Geese	120
Chickens	45
Ducks	45
Total	610

#### Running costs involved include:-

Item	Cost
Hay 150 bales (off the field),	200
Straw, 75 bales,	150
Animal feeds, (estimated: 2 tonne barley/ grain)*	436
Seed,	450
Vets Bill (includes AI, mineral supplements)	250
Administration	50
Rotivator hire	50
Distribution/ Transportation	60
Total	1610

\* Estimated on £109 per half-tonne rolled barley 23<sup>rd</sup>, October 2007, Clunderwen farmers

Sales of pedigree Dexter heifer, = £200	200
Sales of beef, = £50	50
Sales of Brecon Buff geese, 8 p.o.l. @£25 = £200	200
Sales of ducks, 10 p.o.l. @£6 = £60	60
Sales of Ixworth Hens and Cockerels, 10 p.o.l. @£5 = £50	50
Total	560

### **Total Set-up costs – Business plan**

Hazels	1495
Apples	1226
Plums	609
Raspberries	439
Blueberries	1544
Livestock	610
Garden (soil)	495
Total	6418

The total establishment costs (aside from the major infrastructure outlays (land, barn, etc) are calculated to be £6418.

When each of the enterprises comes into fruition it will pay back 10% of its respective set-up costs annually:

**Please see attached spreadsheets for full cash flow breakdown**

### **Future Possibilities.**

We have very deliberately focused on establishing a variety of markets to support us. There is room for expansion within each of these markets.

In addition we have been considering various additional new initiatives:

- 3 year old hazelnut cob trees sell for £15 each. It is a relatively simple process to establish new trees by “pegging down” the young shoots. Similarly they may be a good market for blueberry bushes and raspberry canes.
- Hoppi is very interested in exploring the possibility of producing “smoothies” for the hub café. We would already be producing fruit and nuts. These along with cucumbers and other vegetables could be combined to produce a range of “smoothies”. It is planned that she will explore the potential for Smoothie production at the “Food Centre Wales” at Horeb. This will begin once the holding is fully established.





## 5. Needs

- **Fuel requirements for heating**

At present our family lives in a wooden house which is heated by means of a woodburner. The woodburner (Clearview) is very efficient and also heats our hot water during the winter. We are well versed in wood harvesting, storage and preparation. We estimate that we will burn 3 tonnes of seasoned wood in our new home per annum.

We estimate that a tonne of seasoned firewood costs £90  
Total cost = £270

- **Fuel requirements for cooking**

Presently our family cooks on LPG gas. Our current annual bill (228kg LPG Butane in 19kg bottles) is about £200. We are planning to replace this fossil fuel consumption with a wood fired kitchen. We estimate that such a venture would consume about 2 tonnes of seasoned firewood. The equivalent of £180

- **Provision of water**

We estimate that we will be using about;  
210 litres drinking water a week  
1100 litres washing water a week  
3200 litres irrigation water a week

Total annual water consumption = 234,520litres

Basing charges upon 0.26 pence per litre plus £30 standing charge (*Dwr Cymru*) : £639.75

- **Household food needs (annual)**

Current household expenditure on food:

Category of food	Percentage of our current household food spend	Value £
Bread/ rice/ pasta/ cereals	9	747
Buns/ cakes/ biscuits	2	166

Meat	10	830
Fish	4	332
Eggs	2	166
Dairy	15	1245
Fruit	18	1494
Cooking oil	1	83
Dried fruit/ nuts	2	166
Vegetables	28	2324
Sugar/ sugar products	1	83
Chocolate	1	83
Ice cream	1	83
Tea	1	83
Fruit/ veg juices	5	415
		8300

Total annual food needs for the family = £8,300  
The equivalent of £1660 per person

- **Basic household clothing needs**

Lammas guidance: £235 per person.  
Hoppi makes many of our family's clothes. Some of our clothes are sourced through second hand shops.  
Therefore we would reckon on an adjusted figure of £135 per person.

Total annual clothing needs = £675

- **Household electricity needs**

We estimate that we will use 2200 kWh per annum

At 15p per kWhr for renewably sourced electricity,  
Our annual needs are the equivalent of £330

- **Annual dwelling maintenance**

Based on our current annual dwelling maintenance costs, we estimate that this will be about

Labour 32 hrs per year, £400

Materials, £200

- **Other overhead requirements**

Council tax, £500

Lease rental, £1000

Telephone, £240

Travel, £600

Mortgage repayment (see section 13), £1200

**Household needs:**

Item	Year 3/4/5
Household Heating Cooking Fuel	450
Water	640
Food	8300
Clothing	675
Electricity	330
Dwelling maintenance	600
Council Tax	500
Lease Rental	1000
Telephone	240
Travel	600
Mortgage repayment	1200
Total	14535

This figure would remain constant throughout years 3, 4 and 5

## 6. Produce

### · Food grown

We currently produce about 10% of our food needs. Once we establish ourselves at Lammas we expect to produce all our own vegetables, fruit, meat, dairy, eggs and honey. We estimate that this would account for about 80% of our food needs.

#### Proportion of food produced from land:

Category of food	Percentage of our current household food spend	Value £	Categories we will grow/ produce	Food grown - Percentage	Food grown- Value £
Bread/ rice/ pasta/ cereals	9	747		0	0
Buns/ cakes/ biscuits	2	166		0	0
Meat	10	830	Yes	10	830
Fish	4	332		0	0
Eggs	2	166	Yes	2	166
Dairy	15	1245	Yes	15	1245
Fruit	18	1494	Yes	18	1494
Cooking oil	1	83		0	0
Dried fruit/ nuts	2	166	Yes	2	166
Vegetables	28	2324	Yes	28	2324
Sugar/ sugar products	1	83		0	0
Chocolate	1	83		0	0
Ice cream	1	83		0	0
Tea	1	83		0	0
Fruit/ veg juices	5	415	Yes	5	415
	100	8300		80	6640

Therefore we expect to produce the equivalent of £6,400 of food for ourselves.

### · Water

Our holding will source all of its water from the site, and process all of its waste water on site.

- **Electricity generated through renewable services**  
All of our electricity will be produced on site. The equivalent of £330
- **Fuel produced**  
All of our firewood will be produced on site. The equivalent of £450. It will take some time for the SRC to come into full production.
- **Other land based products and services**  
See Spreadsheets above

**Annual building maintenance**

Labour £400 (we will supply)

**Household Needs Met:**

Item		Year 3		Year 4		Year 5
Food Grown	30%	2490	60%	4980	80%	6640
Water		640		640		640
Electricity		450		450		450
Fuel	50%	225	75%	337	100%	450
Land based business income		16		1376		4195
Building maintenance		400		400		400
Total		4221		8183		12775

## **7. Calculation**

	Needs quantified	Produce quantified	Percentage
Year 3	14,535	4,221	29%
Year 4	14,535	8,138	56%
Year 5	14,535	12,775	88%

## **8. Positive Contribution**

We will bring vitality, energy and good humour to the project.

Paul has been the driving force behind the Lammas project. He has played a central role since its beginning. He foresees that this will continue.

Paul has lots of experience in training and working horses and he will act in an advisory capacity for people considering this option.

Hoppi will bring with her a wealth of knowledge, experience, and skills in developing empathic communication, authentic relationships and conflict resolution. She is trained and has extensive experience with using the therapeutic arts for health & well being. Her passion for education will benefit the Pembrokeshire LEA.

Paul, Jarro and Emba are all learning Welsh

## **9. Transport**

We intend to run a car-share club. We will nominally own and manage the vehicle. We will offer it for hire at 60 pence a mile. There will be a pre-booking scheme. In particular Simon and Jasmine Dale of plot 7 are keen to participate in this arrangement. We are open to additional residents joining this scheme.

We are both keen walkers and cyclists.

## 10. Functional Need

### A typical day in:-

#### Spring

Paul: 7am rise, milk the cows and set to pasture.  
8am. Let out and feed geese, ducks and chickens  
9am. Breakfast.  
9.30am. Sowing seeds in Polytunnel  
11am. Mulching fruit trees.  
1pm. Lunch  
2pm. Spreading compost across garden beds.  
3.30pm. Harvesting food for dinner.  
5pm. Feed, and put away geese, ducks and chickens  
6pm. Bring in, feed and milk cows  
7pm. Dinner

Hoppi: 7am. rise, childcare.  
8am. Breakfast  
9am. Marketing Lammas training company Courses.  
11am. Watering polytunnel.  
1pm. Lunch  
2pm. Weeding raspberries.  
4pm. childcare.  
5.30pm. cook dinner  
7pm. Dinner

#### Summer

Paul: 6am. rise, bring in the cows, milk and set to pasture.  
7am. Let out and feed geese, ducks and chickens  
8am. Breakfast.  
9.30am. Planting out seedlings.  
11am. Watering Polytunnel.  
1pm. Lunch  
2pm. Harvesting food for dinner  
4pm. childcare  
5.30pm. Cook dinner  
7pm. Dinner  
8pm. Weeding vegetable beds.

Hoppi: 7am. rise, childcare  
8am. Breakfast.  
9am. Harvesting blueberries.  
11am. Packing and delivering blueberries  
1pm. Lunch  
2pm. Mulching Fruit trees



4pm. Weeding vegetable beds.  
7pm. Dinner  
8pm. Feed, and put away geese, ducks and chickens  
9pm. Bring in, feed and milk cows  
7pm. Dinner

## **Autumn**

Paul: 7am rise, childcare.  
8am. Breakfast  
9.30am. Harvesting hazelnuts  
11am. Harvesting vegetables  
1pm. Lunch  
2pm. Harvesting fruit.  
3.30pm. Harvesting food for dinner.  
5pm. Feed, and put away geese, ducks and chickens  
6pm. Bring in, feed and milk cows  
7pm. Dinner

Hoppi: 7am rise, milk the cows and set to pasture.  
8am. Let out and feed geese, ducks and chickens  
9am. Breakfast..  
9.30am. Harvesting plums  
11am. Juicing plum harvest  
1pm. Lunch  
2pm. Therapy for client  
4pm. childcare  
5.30pm. Cook dinner  
7pm. Dinner

## **Winter**

Paul: 7.30am rise, milk the cows and feed.  
8.30am. Let out and feed geese, ducks and chickens  
9.30am. Breakfast.  
10am. Cutting and transporting Short Rotation Coppice  
11.30am. Pruning fruit trees.  
1pm. Lunch  
2pm. Mucking out cows.  
3pm. Harvesting food for dinner.  
4pm. Feed, and put away geese, ducks and chickens  
5pm. Bring in, feed and milk cows  
6pm. Dinner

Hoppi: 7.30am rise, childcare  
9am. Breakfast.  
9.30am. Cheesemaking.  
11am. Feeding raspberries  
1pm. Lunch  
2pm. Admin work.

4pm. childcare  
4.30pm. cook dinner  
6pm. Dinner

## Functional Need

Running a smallholding such as the one we envisage will require constant, careful observation and supervision. We are proposing to create a very complex and inter-related network of habitats. Each requiring careful design, implementation, maintenance and evaluation. We do not underestimate the challenge of what we propose. However with such an intense approach to farming there will come huge benefits. The main feature of running such a complex operation will be to attain such a high degree of intimacy with the land on which we live. The principal benefit is that it will support, nourish and inspire us while at the same time benefiting the ecosystems on which we depend for life. We will be increasing the biodiversity, increasing the soil depth, increasing the wildlife value of the land. As an integral part of this we will be providing a home and a livelihood for ourselves.

There are some aspects of what we are proposing which will require an early morning or a late night presence on the land. Examples of this include:-

- The cows. An un-well cow or a cow in calf will need supervision 24 hours a day.
- The nuttury will require early morning and late night observation from late July to harvest time (mid September) to ensure that the crop is not being eaten by squirrels.
- Poultry require early morning and late night attention during the summer months.
- Keeping poultry will require a diligent vigil for foxes and other predators. The risk of predatory attack is greatest in the least sociable hours.

Our success as a smallholding will largely rely upon the intimate relationship which we will nurture with our plot. Each day we will be harvesting fresh food for our meals. This harvesting process will take place across the whole site and will probably include livestock produce (for example eggs) from across the site, vegetables from the garden, fruit from the orchard/ soft fruit area and wild food from the hedgerows/ margins.

In addition to this our connection with the other plot holders will provide us with a wealth of support and trading opportunities. Some of these connections will take place on a formal basis (for example, cow club, car share, sale of produce to neighbours). There will also be a large degree of interaction which will take place on an informal basis (for example, swapping of produce, borrowing a cockerel or helping a neighbour trim their sheep's feet). These informal connections and interactions will play a very important part in the success of the project. For it is through the sharing of skills, resources and information that we will be able to create a vibrant, healthy community momentum. This group momentum is important because what we are proposing to do is, in the context of an economy

based on cheap fossil fuels, actually very challenging. The viability of what we propose is dependant upon both an intimate relationship with the land and a vibrant, healthy interacting community of people.

# 11. Temporary solutions and timescales

Assuming development commences on January 1<sup>st</sup>, 2009:

January 2009	Fence plot perimeter
February	Plant fruit trees, Mulch vegetable and fruit gardens with big bales hay.
March	Plant hazelnut trees, Begin planting willow
April	Lay trackways
May	Dig ponds and excavate house plot
June	Cast foundations for house
July	Move into Caravan on plot, Commence building works on house and outbuildings
August	
September	
October	
November	
December	
January 2010	
February	Plant Larch Mulch vegetable gardens Plant soft fruit.
March	Continue planting willow Plant ash, chestnut and hazel LRC
April	
May	
June	
July	
August	
September	
October	
November	
December	House and outbuildings completion – move into house, remove caravans
January 2011	Commence barn and polytunnel building
February	Plant up vegetable garden with maincrops and green manures.
March	Complete SRC and LRC planting
April	
May	
June	
July	
August	
September	Complete barn and polytunnel building
October	Introduce livestock
November	Commence building of root-cellar
December	

### **Temporary accommodation.**

From January 2009 until January 2011 we will park a small bow-topped caravan (14ft) on site. This will initially be used as an office for the building works and as temporary accommodation for us. From July 2009 til January 2011 we will park an additional bow-topped caravan and a 16 ft yurt on the plot. These will be used to house the family.

## **12. Additional Sources of Income**

Paul will be wholly engaged full time on the plot working the land. Occasionally he will run tours and courses as outlined below.

Hoppi will be engaged for the most part on the plot, though she will also work part time as a therapist/ trainer/ course facilitator.

Hoppi will provide additional income for the family through communications and emotional intelligence training. She is currently well established in this profession within Swansea. To begin with we foresee some traveling happening whilst Hoppi's career is in transition. She will gradually move her career westward, running trainings in local centers, schools and colleges.

Hoppi will also offer journeywork and integrative arts therapy for local clients. She currently offers this in Swansea and it is a very successful venture. The therapy room will be used for this purpose.

It is estimated that Paul will be running courses about 10 days in every year. It is estimated that Hoppi will be running courses about 10 days in every year. She also expects to be running local trainings/ therapies approximately 40 days in a year. Some of this work will take place on the site, using the therapy room or community hub. Some of this work will take place off site.

In addition to this we intend to establish a training company:

### **Lammas Training Company**

We will establish a training company that will provide an active outreach for furthering the project's aims of promoting low impact development. The company will work closely with the Society and the residents of the settlement. We will employ the skills and services from residents as well as bringing in additional speakers from the locality. We do not anticipate

being the only such training provider within the settlement, rather we aim to offer trainings specific to our own passions and skills.

In particular we are considering offering the following residential courses.

- “Low impact settlements”, a 3-day residential course (July)
- “Living off the land”, a 3-day residential course (July)
- “Low impact architecture”, a 3-day residential course (September)
- “Self awareness in community” – 4 day residential (April)
- “Sustaining healthy communities” – a 3 day residential (May)
- “Living in Stillness” – 3 day residential (June)

We would insist that all participants would arrive and depart by public transport, and we would provide all the necessary links and information for this. We would hire a section of the society’s camping facilities to provide accommodation. We would hire the Society’s meeting room (hub hall) as a workshop/ lecture space. To begin with we would ask participants to bring their own tents. In the long term we would like to supply canvas tents for people to stay in, however this is something that we would build up over time. We would provide food for the course.

We would begin in year 4 of the project and we would build up to 6 courses in a year.

### ***“Low impact settlements”***

*Including talks and tours from residents of Lammas*

*Day 1 – A tour of the Lammas settlement with discussion. Lectures on various legal structures and planning. Slideshows and films on Findhorn and Hockerton. Discussions and workshops on land based living.*

*Day 2 – A slideshow and presentation about Hockerton Housing Project. An overview of low impact architecture. Workshops on Media training.*

*Day 3 – A presentation on Ecovillages. Talks about “pulling it all together” and “realizing your dream”.*

### ***“Living off the land”***

*Including “hands on” workshops, talks and tours from residents of Lammas.*

*Day 1 – Introduction and tour of Lammas. Livestock and pasture management. A visit to Matthew and Chris’s organic farm. (walk)*

*Day 2 - Vegetables and Polytunnels. Including talks and workshops by local people. Coppicing and Crafts*

*Day 3 – Orchards and soft fruit. A visit to Mike Foxwells orchard. (walk). Field crops and poultry. Talks, presentations and tours.*

### ***“Low Impact Architecture”***

*Including daily workshops in the design and construction of a small livestock shelter. Including talks and tours from residents of*

*Lammas.*

*Day 1 – Low Impact Design. Timber framing*

*Day 2 – Straw bale/ cob. Including a visit to Chris Day's kindergarten (minibus)*

*Day 3 – Roofing options. Services and renewables*

***“Self awareness in community”***

*Day 1 – Building an understanding of the nature of Relationships and Trust – Neurology and exploring the 4 core emotions*

*Day 2 – Deepening in Self Awareness & Regulation*

*Day 3 – Exploring Social Skills ie Empathy, Rapport & communication skills & patterns*

*Day 4 – Integration and commitment to personal growth*

***“Sustaining healthy communities”***

*Day 1 – Exploring Objective & subjective communication, feelings & Needs*

*Day 2 – Expression of feelings & needs, Role of Empathy*

*Day 3 – Techniques of conflict resolution*

*Day 4 - Integration and commitments*

***“Being in Stillness – Honoring the sacred”***

*Day 1 – Clear Intent, process work, Entering Stillness, belief changes*

*Day 2 – Clear Intent, entering stillness, body work, music, movement.*

*Day 3 – Clear Intent, entering stillness, body work, poetry, music, movement.*

*Day 4 – Clear Intent, entering stillness, body work, visual expression, music, movement*

*Day 5 – Clear Intent, entering stillness, Honoring the sacred\**

*\*May include sweat lodges, fire walks, deep earth connection throughout.*

**Finance**

The courses would be run for up to 12 participants. The cost would be in the region of £50 a day. From that £10 would go towards accommodation costs, £10 would be food costs, £10 would be admin and company costs, £5 would cover visiting speakers, £5 would go towards covering residents contributions, leaving £10 profit per person per day. This would total at approximately £500 for a four day course (assuming it is fully booked). (There would be bursaries available.)

**Market Research**

Across the UK there are but a handful of places offering courses of this nature:-

- Findhorn (Scotland) offers an extensive range of courses about spirituality, community living and ecovillages.
- The Center for Alternative Technology (Snowdonia) offers a wide range of courses on green architecture and renewables.
- Hockerton Housing Project (Nottinghamshire) offers a small range of trainings in green architecture and community living.
- The Low Impact Living Initiative (Buckinghamshire) offers a small range of courses and workshops in practical living solutions (for example solar water heating systems).
- There are additional small scale providers in this area.

Having spoken to people from all of these places, it is very clear that demand for such trainings heavily outweighs supply.

We believe we will be creating a new angle within this niche market.

Lammas will be the first low impact settlement within the UK. It will be a unique venture in that there will be many low impact dwellings clustered together, living off of the land. It will provide a valuable pool of examples, skills and research into this new approach to sustainable living solutions. We will be able to draw upon a wide range of skills and abilities both from within the settlement and also from the wider community.

#### **Why we think we can deliver this.**

Paul has been the driving force behind the Lammas project since its inception. He is thoroughly familiar with the many aspects involved in a low impact settlement. He has the organizational ability to match his passion.

Hoppi is well established as an excellent trainer in communication skills and emotional intelligence. She runs contemporary spirituality courses and creates the safety of sacred space for honest self inquiry and realization to the patterns that bind. She inspires the magnificence that we are to shine through, and has the skills and compassion to facilitate clearing out the silent saboteurs which inhibit this magnificence from being. She is a qualified and experienced therapist, healer and educator.



### 13. Set up Costs

We are in the fortunate position of owning our present house. It is estimated at being worth £170,000 to £180,000. We have a £90,000 mortgage.

Item	Estimated cost (£)	Reasoning
Lease	30,000	
Groundworks	3,000	Jcb work – trackway, ponds, reedbeds etc
House	33,000	110sqm house @ £300 sqm
Furnishings	7,000	
Outbuildings	11,600	58 sqm outbuildings @ £200 sqm
Barn-build	27,200	136 sqm @ £200 sqm
Polytunnel-build	3,000	
Fencing/ hedging	2,740	£6 per running meter (double fence and hedge), £2 per running meter fence.
Tree planting	2,000	SRC, LRC, Larch
Business set-up	6,420	See business plan
Total	125,960	

Of this, £70,000 will come from our house sale. We have savings of £10,000. Our families will contribute £30,000. The remainder will come from a £15,000 mortgage which we will repay at a rate of £100 pcm.(6.45% over 25 yrs)

## Final Comment

We have presented a detailed 5 year plan for a low-impact sustainable smallholding. We have the necessary resources and skills to create a productive, beneficial and beautiful small farm as part of a larger settlement plan. Adaptability and flexibility will be key to its success, as will the support of local government.

Sustainability is a pressing need for our environment, our economy, and our children.



Dinosaur eating salad with our daughter, Emba

## Year 1

[illegible]

Paul and Hoppi Wimbush's Cash flow forecasts (plot 6)

Year 2

	January	February	March	April	May	June	July	August	September	October	November	December	Income	Ongoing
<b>Hazelnuts</b>														
Running Costs														
Income (£) retail														
Income (£) wholesale														
Payback of establishment costs														
<b>Apples</b>														
Running Costs								-13	-14	-13				-40
Income (£) retail								60	60	60			180	
Income (£) wholesale								22	23	23			68	
Payback of establishment costs														
<b>Plums</b>														
Establishment costs														
Running Costs														
Income (£) retail														
Income (£) wholesale														
Payback of establishment costs														
<b>Blueberries</b>														
Running Costs														
Income (£) retail														
Income (£) wholesale														
Payback of establishment costs														
<b>Raspberries</b>														
Running Costs														
Income (£) retail														
Income (£) wholesale														
Payback of establishment costs														
<b>Smallholding-costs</b>														
Hay														
Straw														
Animal Feed														
Seed			-200											-200
Vets bill														
Admin														
Distribution														
<b>Smallholding-sales</b>														
Heifer sales														
Beef sales														
Geese sales														
Ducks sales														
Chickens sales														
<b>Total</b>		-200						69	69	70			248	-240
Opening Balance	0	0	-200	-200	-200	-200	-200	-200	-131	-62	8	8		
Closing Balance	0	-200	-200	-200	-200	-200	-200	-131	-62	8	8	8		

Paul and Hoppi Wimbush's Cash flow forecasts (plot 6)

Year 3

	January	February	March	April	May	June	July	August	September	October	November	December	Income	Outgoings
<b>Hazelnuts</b>														
Running Costs														
Income (£) retail														
Income (£) wholesale														
Payback of establishment costs														
<b>Apples</b>														
Running Costs								-13	-14	-13				-40
Income (£) retail								160	160	160			480	
Income (£) wholesale								60	60	60			180	
Payback of establishment costs														
<b>Plums</b>														
Running Costs							-3	-5	-2					-10
Income (£) retail							12	24	12				48	
Income (£) wholesale							5	9	4				18	
Payback of establishment costs														
<b>Blueberries</b>														
Running Costs														
Income (£) retail														
Income (£) wholesale														
Payback of establishment costs														
<b>Raspberries</b>														
Running Costs														
Income (£) retail														
Income (£) wholesale							135	135	68	28			366	
Payback of establishment costs														
<b>Smallholding costs</b>														
Hay							-100							-100
Straw									-150					-150
Animal Feed	-45	-45	-43	-33	-27	-27	-27	-27	-37	-39	-43	-43		-436
Seed		-150						-50						-200
Vets bill												-50		-50
Admin												-50		-50
Distribution												-40		-40
<b>Smallholding - sales</b>														
Heifer sales														
Beef sales														
Geese sales														
Ducks sales														
Chickens sales														
Total	-45	-195	-43	-33	-27	-27	22	293	101	196	-43	-183	1092	-1076
Opening Balance	8	-37	-232	-275	-308	-335	-362	-340	-47	54	250	207	16	
Closing Balance	-37	-232	-275	-308	-335	-362	-340	-47	54	250	207	24		

Paul and Hoppi Wimbush's Cash flow forecasts (plot 6)

Year 4

	January	February	March	April	May	June	July	August	September	October	November	December	Income	Outgoings
<b>Hazelnuts</b>														
Running Costs														
Income (£) retail														
Income (£) wholesale														
Payback of establishment costs														
<b>Apples</b>														
Running Costs								-13	-14	-13				-40
Income (£) retail								240	240	240			720	
Income (£) wholesale								90	90	90			270	
Payback of establishment costs												-123		-123
<b>Plums</b>														
Running Costs								-5	-10	-5				-20
Income (£) retail								25	50	25			100	
Income (£) wholesale								9	18	9			36	
Payback of establishment costs												-61		-61
<b>Blueberries</b>														
Running Costs								-26	-39	-39	-26			-130
Income (£) retail								145	216	216	145		722	
Income (£) wholesale												-154		-154
Payback of establishment costs														
<b>Raspberries</b>														
Running Costs														
Income (£) retail														
Income (£) wholesale														
Payback of establishment costs														
<b>Bow Top Caravans</b>														
Caravan Costs														
Caravan Sale														
<b>Smallholding - costs</b>														
Hay								-200						-200
Straw									-150					-150
Animal Feed	-45	-45	-43	-33	-27	-27	-27	-27	-37	-39	-43	-43		-436
Seed		350						100						450
Vets bill												-250		-250
Admin												-100		-100
Distribution												-60		-60
Payback of establishment costs												-46		-46
<b>Smallholding - sales</b>														
Heifer sales														
Beef sales												50	50	
Geese sales														
Ducks sales										30	30		60	
Chickens sales			25	25									50	
<b>Total</b>														
Total	-45	305	-18	-8	-27	-27	192	896	471	481	-13	-831	2740	-1364
Opening Balance	24	-21	284	266	258	231	204	396	1292	1763	2244	2231	1376	
Closing Balance	-21	284	266	258	231	204	396	1292	1763	2244	2231	1400		

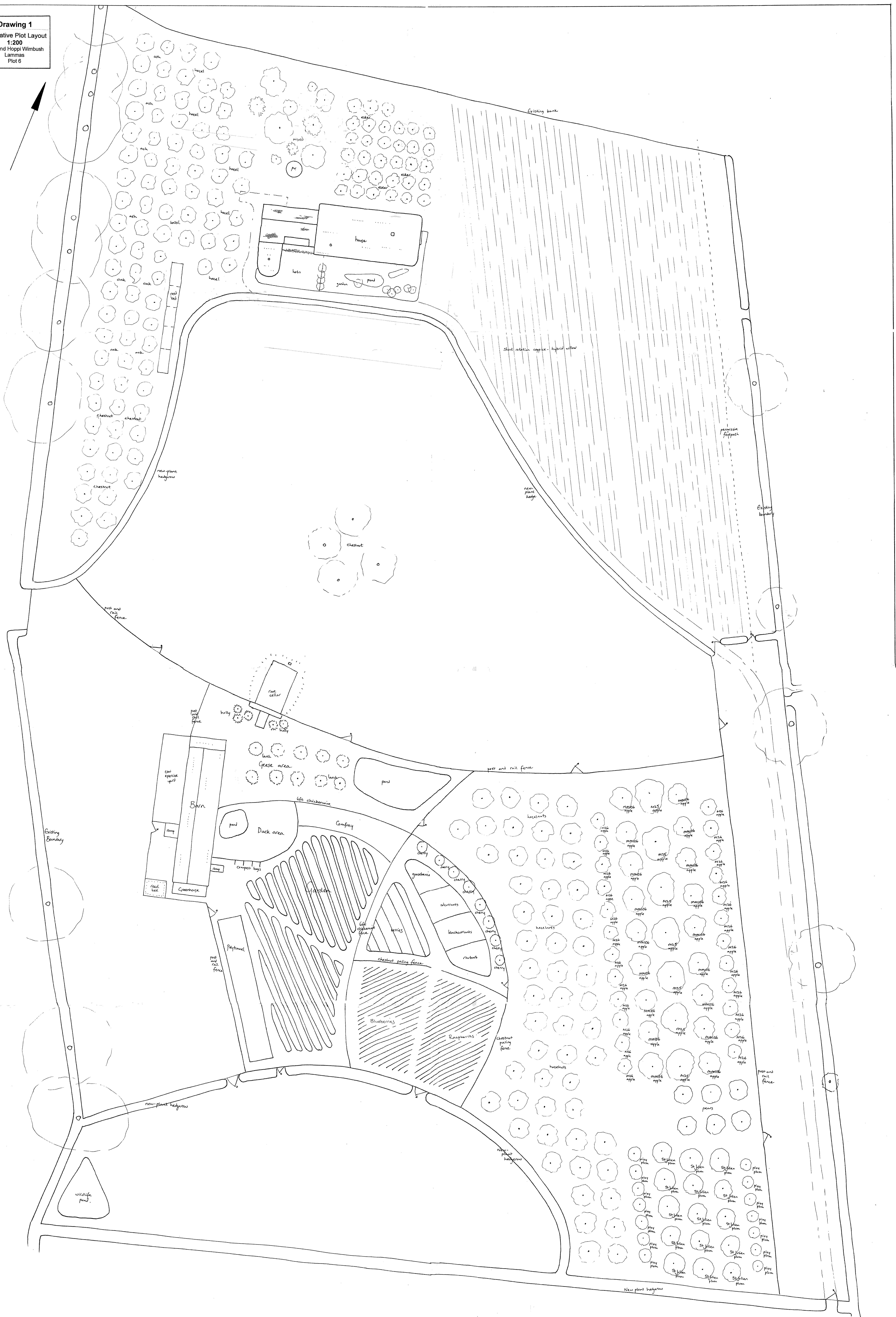
Paul and Hoppi Wimbush's Cash flow forecasts (plot 6)

Year 5

	January	February	March	April	May	June	July	August	September	October	November	December	Income	Outgoings
<b>Hazelnuts</b>														
Running Costs									-100					-100
Income (£) retail									400				400	
Income (£) wholesale									150				150	
Payback of establishment costs												-150		-150
<b>Apples</b>														
Running Costs								-13	-14	-13				-40
Income (£) retail								320	320	320			960	
Income (£) wholesale								120	120	120			360	
Payback of establishment costs												-123		-123
<b>Plums</b>														
Running Costs							-10	-20	-10					-40
Income (£) retail							80	140	76				296	
Income (£) wholesale							35	45	31				111	
Payback of establishment costs												-61		-61
<b>Blueberries</b>														
Running Costs							-36	-54	-54	-36				-180
Income (£) retail							100	150	150	100			500	
Income (£) wholesale							289	433	433	289			1444	
Payback of establishment costs												-154		-154
<b>Raspberries</b>														
Running Costs														
Income (£) retail														
Income (£) wholesale							271	271	136	54			732	
Payback of establishment costs												-44		-44
<b>Bow top Caravans</b>														
Caravan costs	-2198													-2198
Caravan sale						2600							2600	
<b>Pasties and Quiches</b>														
Income					158.4	158.4	158.4	158.4	158.4	158.4			950.4	
Running costs					-14.4	-14.4	-14.4	-14.4	-14.4	-14.4				-86.4
<b>Smallholding- costs</b>														
Hay							-200							-200
Straw									-150					-150
Animal Feed	-45	-45	-43	-33	-27	-27	-27	-27	-37	-39	-43	-43		-436
Seed		-350						-100						-450
Vets bill												-250		-250
Admin												-100		-100
Distribution												-60		-60
payback of establishment costs												-46		-46
<b>Smallholding - sales</b>														
Heifer sales		200											200	
Beef sales												50	50	
Geese sales												200	200	
Ducks sales										30	30		60	
Chickens sales			25	25									50	
<b>Total</b>	-2243	-195	-18	-8	117	2717	646	1409	1595	969	-13	-781	9063.4 4195	-4868.4
Opening Balance	1380	-863	-1058	-1076	-1084	-967	1750	2396	3805	5400	6369	6356		
Closing Balance	-863	-1058	-1076	-1084	-967	1750	2396	3805	5400	6369	6356	5575		



Drawing 1  
Illustrative Plot Layout  
1:200  
Paul and Hoppi Wimbush  
Lammas  
Plot 6





## Drawing 2

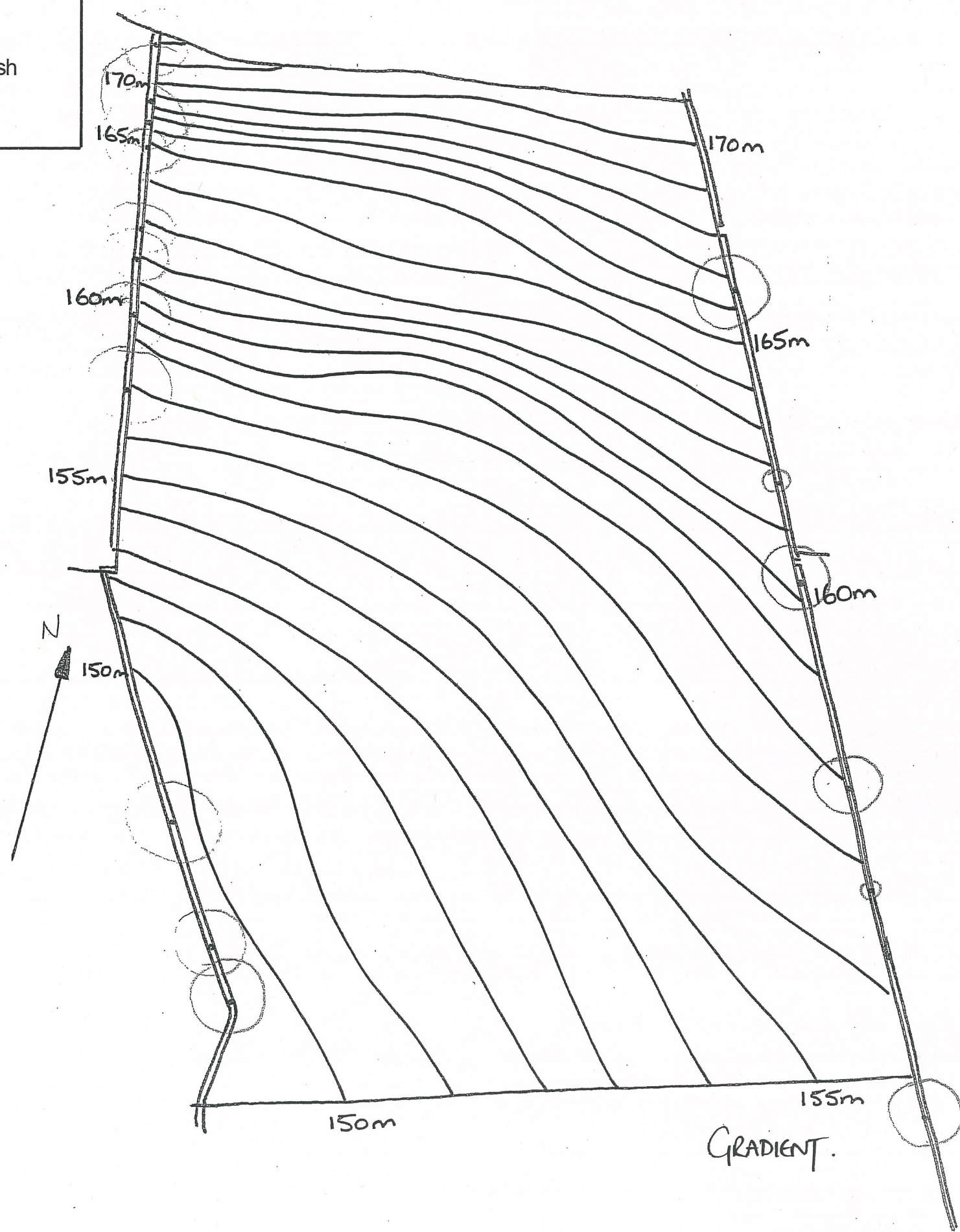
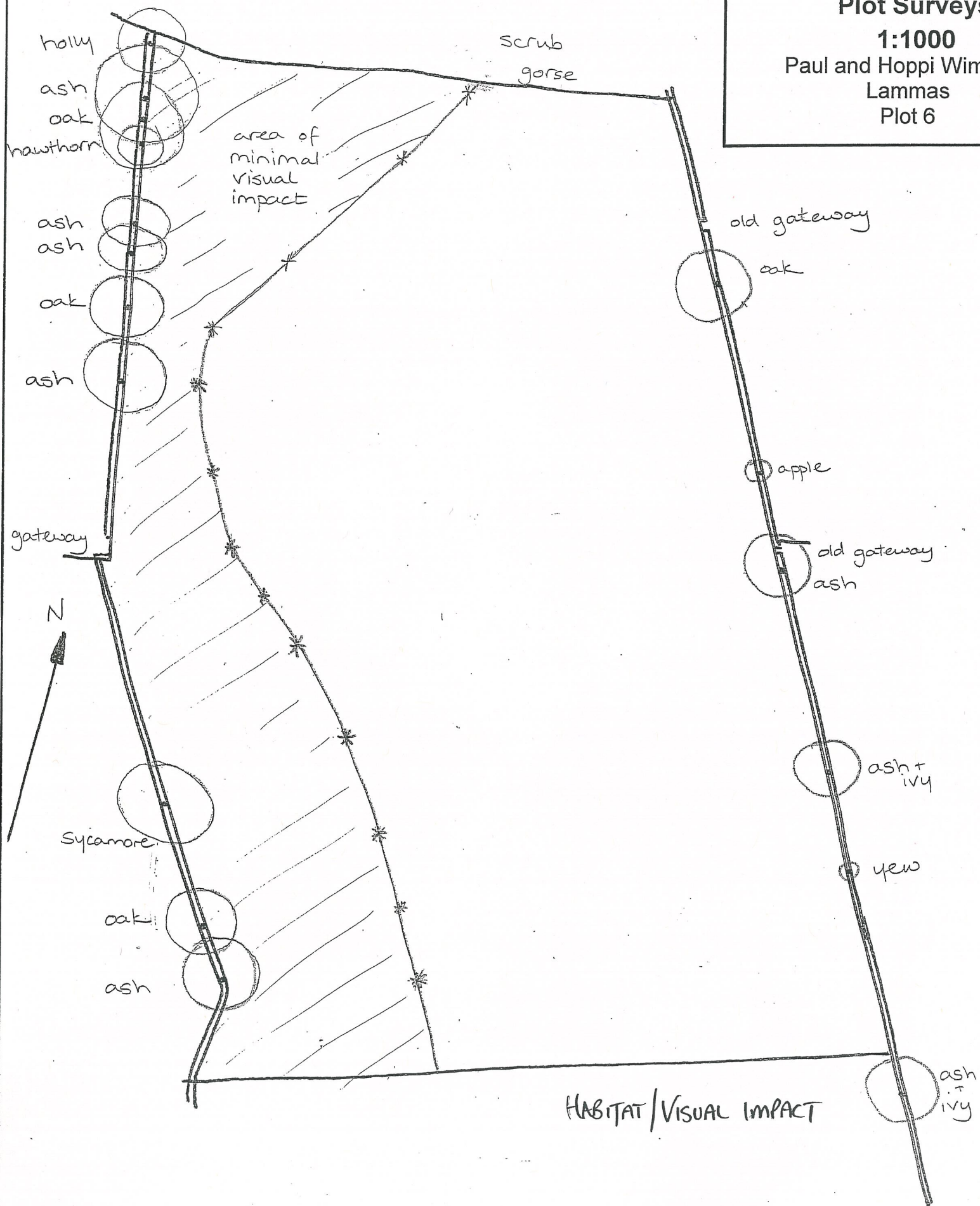
### Plot Surveys

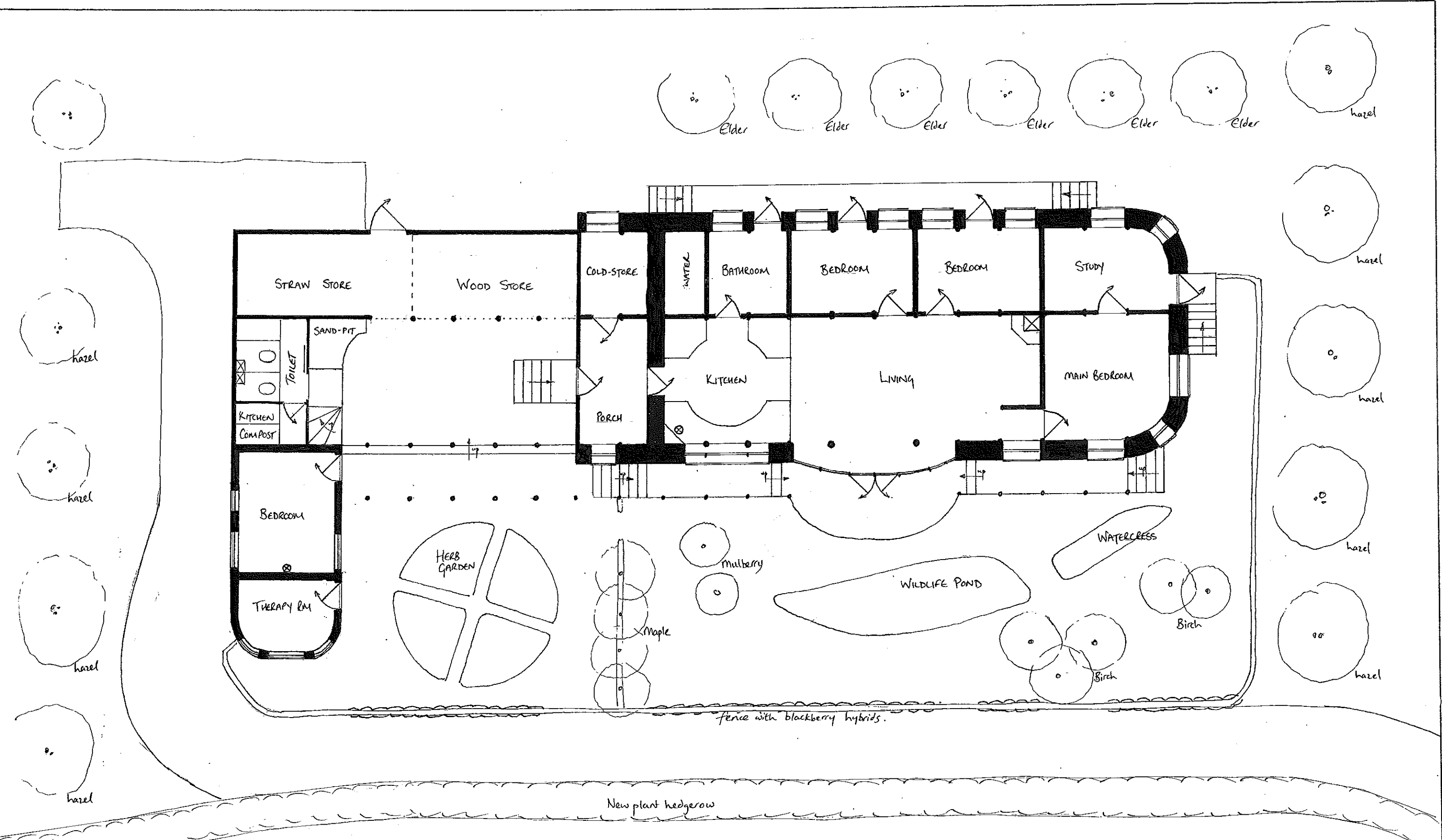
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Paul and Hoppi Wimbush

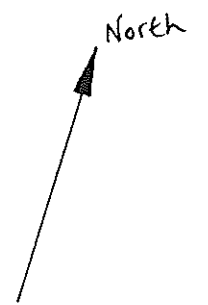
Lammas

Plot 6





**Drawing 3**  
**House Plan**  
**1:100**  
Paul and Hoppi Wimbush  
Lammas  
Plot 6



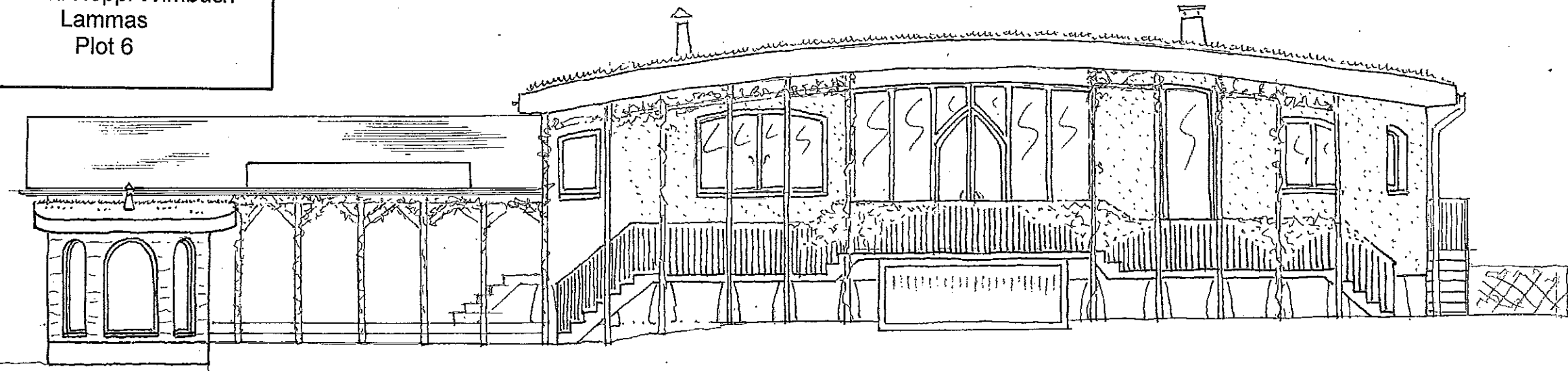
# Drawing 4

## House Elevations

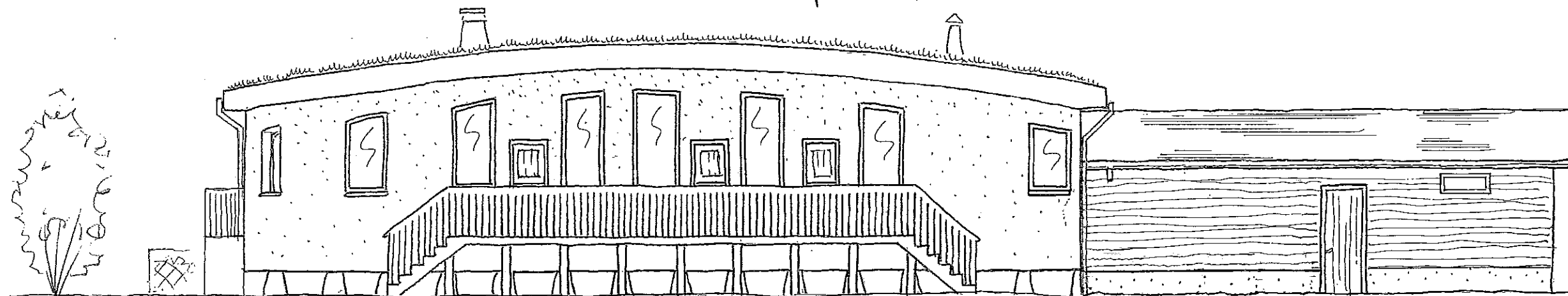
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Paul and Hoppi Wimbush  
Lammas  
Plot 6

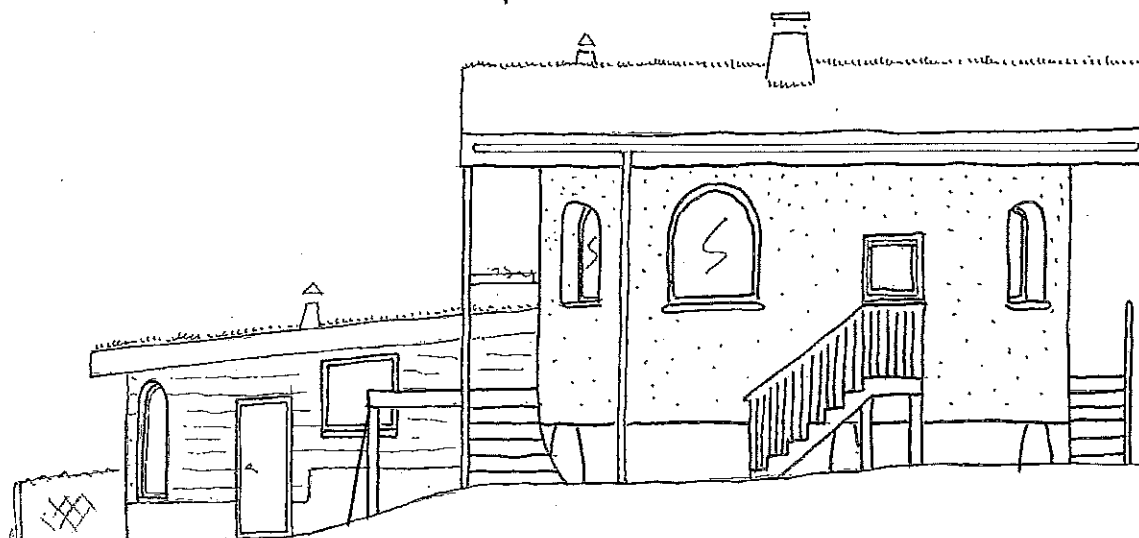
SOUTH ELEVATION



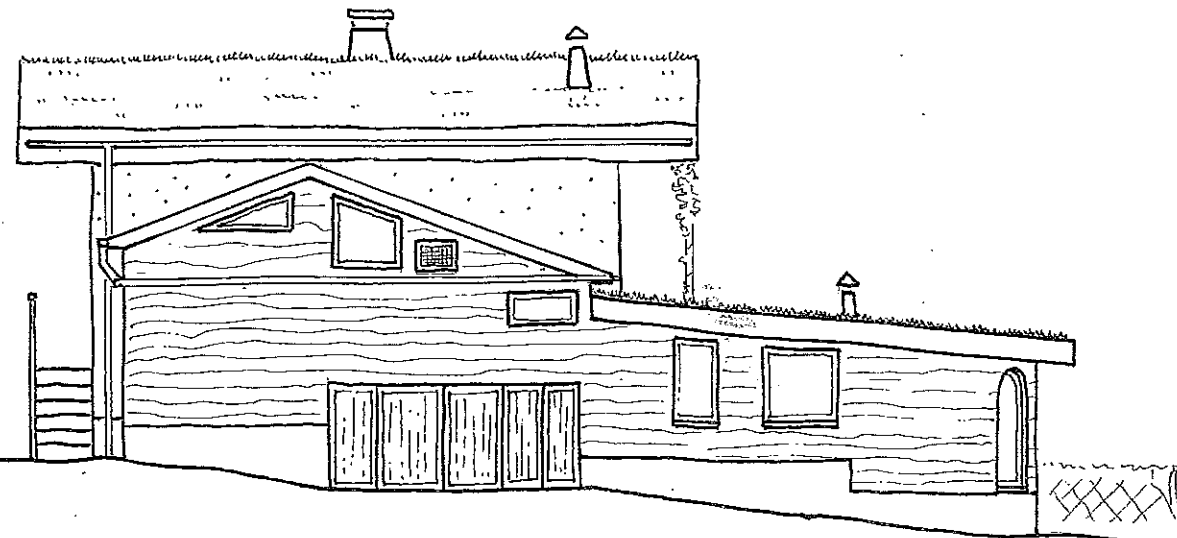
NORTH ELEVATION



EAST ELEVATION



WEST ELEVATION



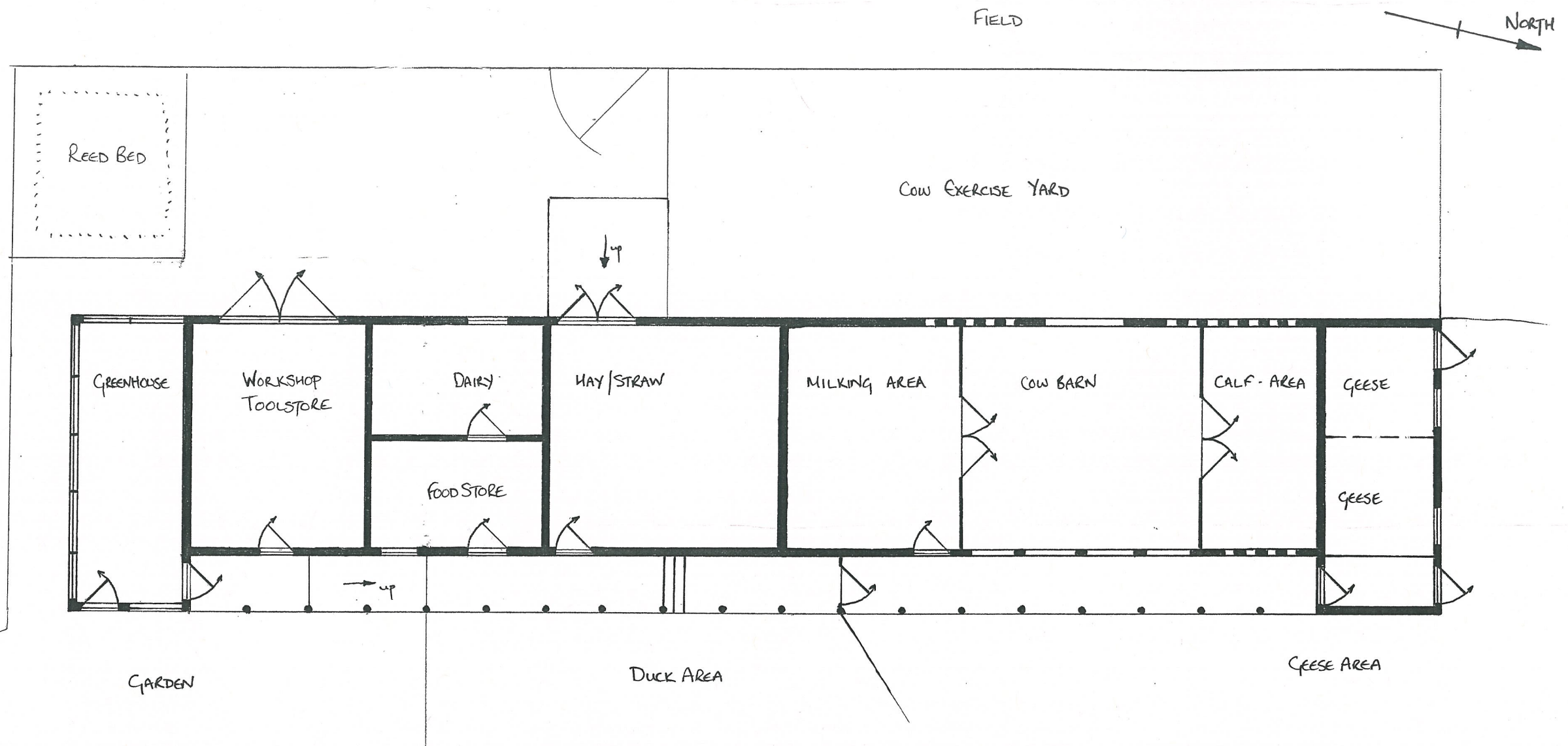


# Drawing 5

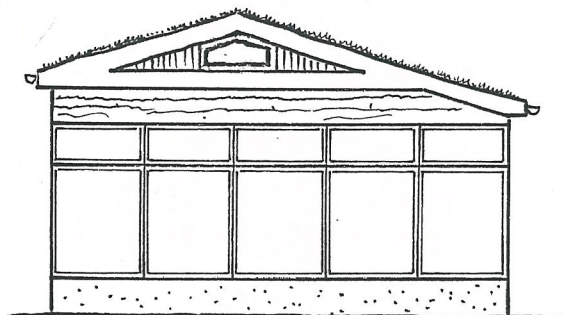
## Barn Plan And Elevations

1:100

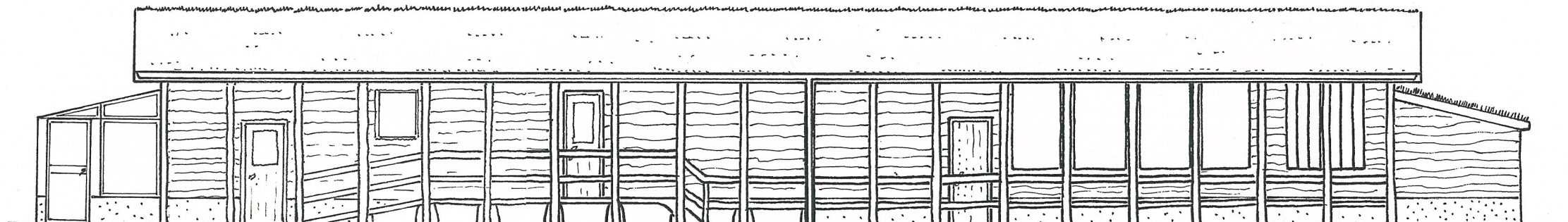
Paul and Hoppi Wimbush  
Lammas  
Plot 6



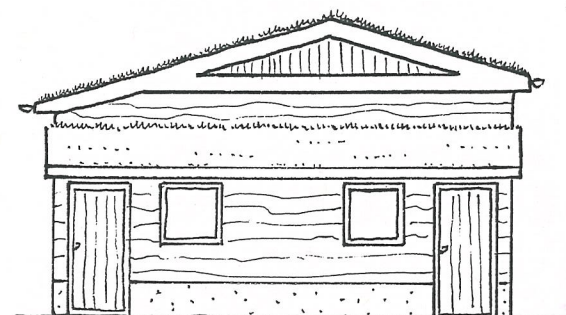
SOUTH ELEVATION



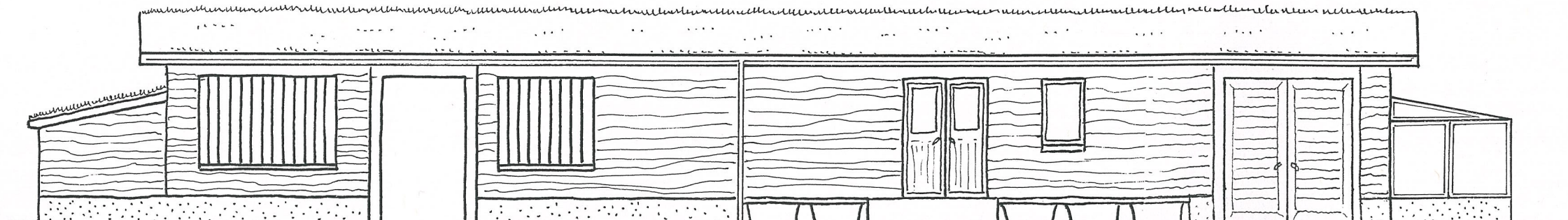
EAST ELEVATION

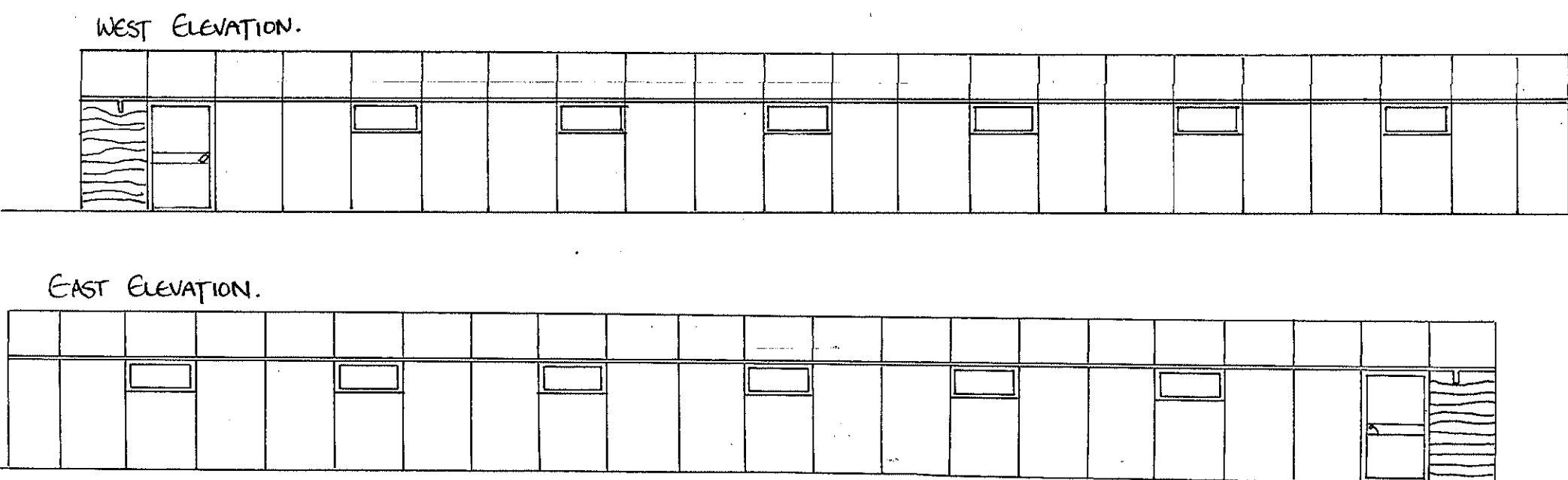
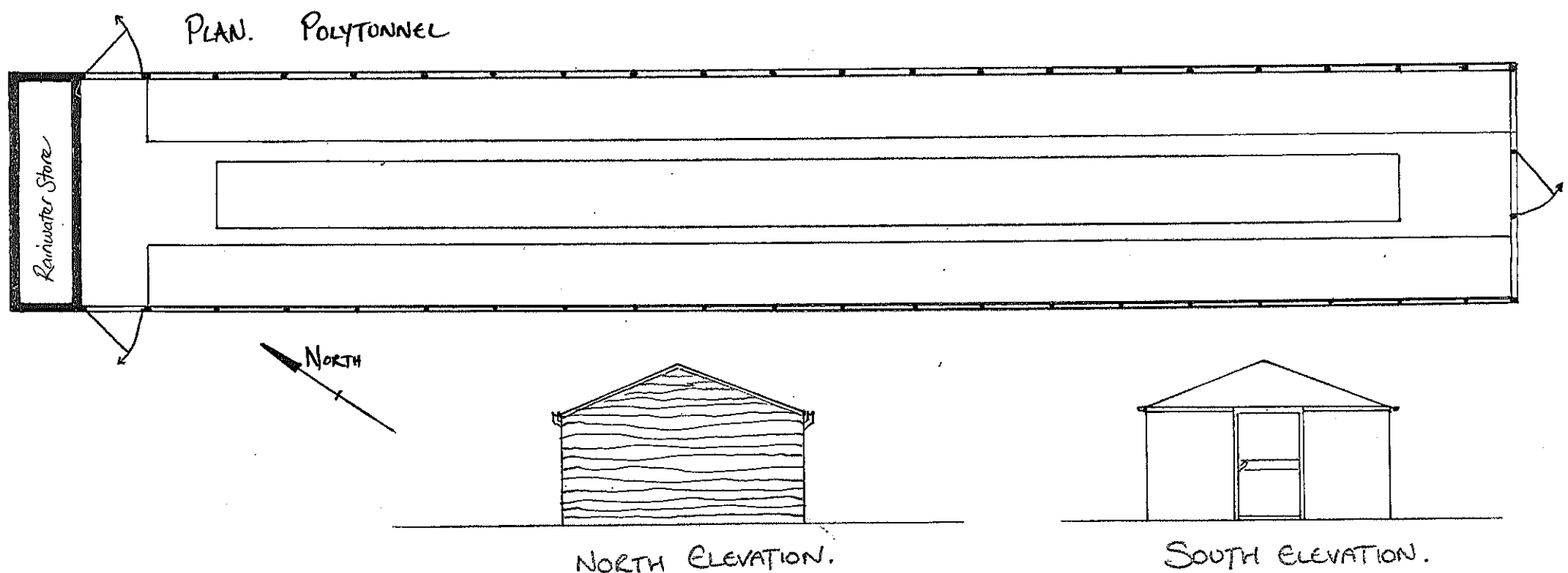


NORTH ELEVATION



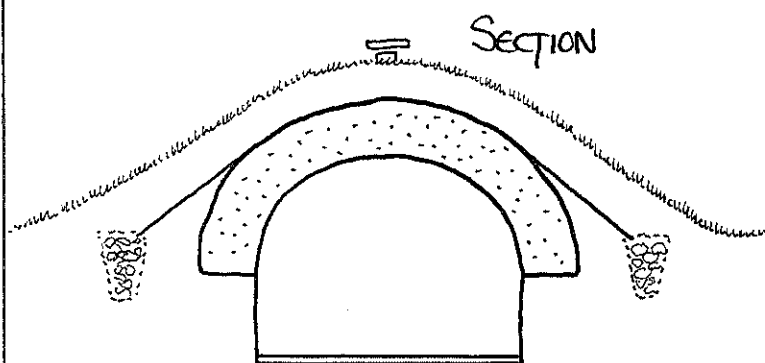
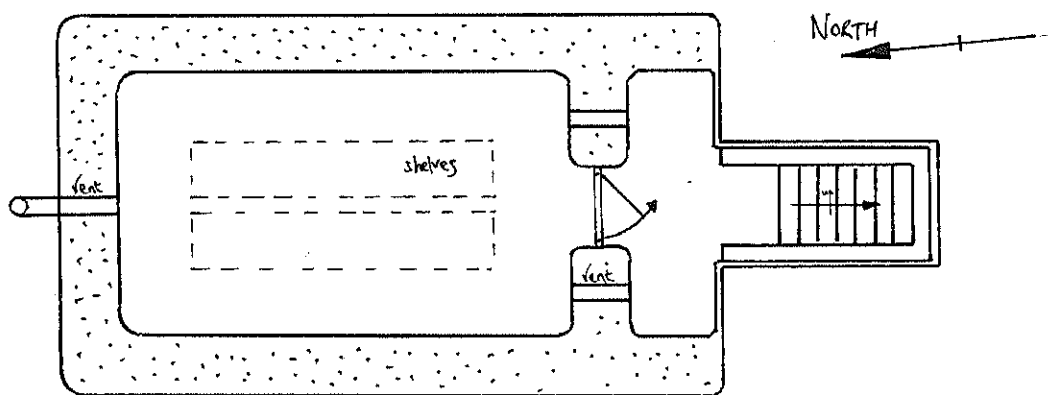
WEST ELEVATION



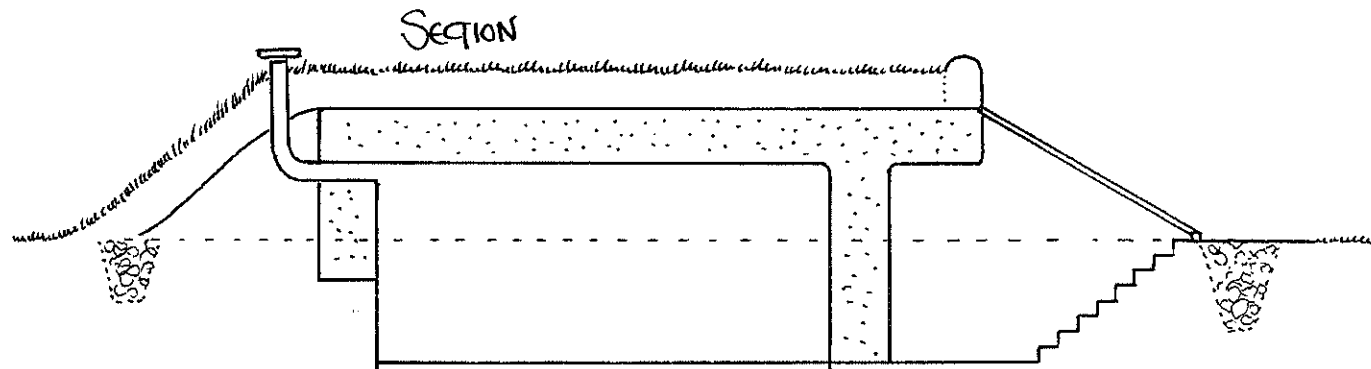


**Drawing 6**  
**Polytunnel  
 And Root Cellar**  
 1:100  
 Paul and Hoppi Wimbush  
 Lammas  
 Plot 6

PLAN  
 Root Cellar



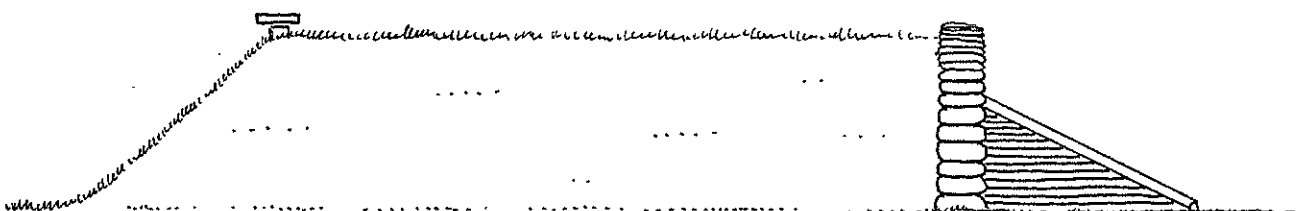
SOUTH ELEVATION



WEST ELEVATION



NORTH ELEVATION



EAST ELEVATION

