

~~Robinswood, The Street, Patching, West Sussex~~

~~Design, Access and Heritage Statement~~

~~INTRODUCTION~~

This report relates to the planning application to the Arun District Council for demolition of some outbuildings and extension and replacement with a new extension and infilling the car port.



Reference should be made to the submission drawings:

0616 Sk 01	Site Analysis
0616 Sk 12	Existing Ground Floor Plan
0616 Sk 13	Existing First Floor Plan
0616 Sk 14	Existing Elevations (1 of 2)
0616 Sk 15	Existing Elevations (2 of 2)
0616 Sk 16	Proposed Ground Floor Plan
0616 Sk 17	Proposed First Floor Plan (roof plan of new)
0616 Sk 18	Proposed Elevations (1 of 2)
0616 Sk 19	Proposed Elevations (2 of 2)
0616 Sk 20	Location Plan
0616 Sk 21	Schematic Illustrating Alterations
0616 Sk 22	Block Plan
0616 Sk 23	Schematic Illustrations

Robinswood, The Street, Patching, West Sussex**Design, Access and Heritage Statement****DESIGN****1 Development Proposals**

- a. The site under consideration is Robinswood, The Street, Patching, West Sussex. The property is located on the southern edge of Patching village with views over the fields to the south. It is a very secluded site of almost exactly 1 acre, which is barely visible from anywhere other than the farm fields to the south. There are neighbouring dwellings but the plots are large and densely covered with trees and shrubs.
- b. The proposal is to demolish the existing garage, an unsympathetic extension to the west side of the existing house, which has a very poor visual connection with the house and is also in poor structural order, considered to be a result of inadequate foundations. Fig 1, below, shows the garage to be demolished.



Fig 1

- c. The original garage was converted into living accommodation as part of the main house many years ago and is also poorly constructed and with little, if any thermal insulation. It is proposed to demolish this also, together with the porch, the Summer House and a large shed at the rear of this building. Fig 2 below shows the extension to be demolished.



Fig 2

Robinswood, The Street, Patching, West Sussex**Design, Access and Heritage Statement**

- d. The proposed extension will occupy the area of this former garage, summer house and shed and will provide a new front door to the dwelling, a small office/sitting area, an ensuite guest bedroom, cloakroom, storage and double garage. It is intended that this extension will be part of the main dwelling and not used as an annexe.
- e. In addition, the existing car port on the west side of the house would be in-filled to create a breakfast/garden room, opening onto a patio area. Fig 3, below, shows the car port between the house and the garage.



Fig 3

- f. The existing house is a mixture of brickwork, stone and tile hanging, see Fig 4 below. It is proposed to remove the tile hanging, which is entirely at first floor level and to replace it with additional thermal insulation and horizontal timber cladding.



Fig 4

- g. The intention is to provide new methods of heating the property, and investigations are being made into the use of a mixture of solar panels, possibly a bio-mass boiler and combined heat and power to reduce the property's reliance on fossil fuels and environmental pollution. A survey of the house was undertaken in January 2007, looking at the general condition of the property and also energy conservation issue. The Applicant has already implemented some elements of that report, in particular the increase in insulation levels. A copy of that report is Appended.

Robinswood, The Street, Patching, West Sussex**Design, Access and Heritage Statement****2 Layout**

- a. The site is approached from The Street, via a pull-off from the road which also provides an entrance to the neighbouring properties, who have right of access over the Applicants' land. The main gate to the drive is the only frontage that the site has on The Street and even this is set back from the road.
- b. The only access to this site is a combined vehicular/pedestrian access. Fig 5, below.



Fig 5

- c. Being a rural location, there is considerable distance between the existing building and its boundaries and also between the proposed extension and the site boundaries.

3 Scale

- a. The proposed extension is single storey, in order to respect the character and style of the 1960's property. Over the years, some of the alterations carried out, such as the construction of the garage on the west side and the conversion of the former garage have spoilt the appearance of the architect-designed property.
- b. The only windows proposed for the new extension face south, where there is open countryside. The only exception to this being a small section of glazing facing east and the new front door glazed entrance screen. However, both of these are positioned such as to avoid any possible overlooking of neighbouring buildings.
- c. The proposed garden room simply infills below the existing roof, where there was formerly a car port. A small slit window looks north up the drive and the folding sliding doors look south over the same open countryside.

4 Landscaping

The existing landscaping is to remain largely as it is which is natural in form. There will need to be some removal of shrubs – largely laurel and similar plants, in order to accommodate the new extension and the realigned parking and driveway to give access to the new garage.

Robinswood, The Street, Patching, West Sussex

Design, Access and Heritage Statement

5 Appearance

- a. The existing building is in two storeys under an unequal pitched roof, with north and south-facing gables. The first floor was extended over the ground floor lounge on the south side some years ago. Fig 7.



Fig 7

- b. The new extension is largely flat roofed behind a small parapet, with a zinc-clad pitched roof over the office/seating room and guest bedroom, which contains some north-facing rooflights and on the south facing slope, solar panels.
- c. The walls will be a mixture of render and fairface brickwork. The brickwork helping to tie the new extension into the main house. The doors to the garage would be large timber sliding doors. The glazed screens and doors would also be in timber. A timber brise-soleil frames the south-facing glazing and reduces solar gain to the study and guest bedroom.

6 Use

- a. The house is to remain a single-occupancy dwelling.

ACCESS

The site is rural in nature and form and therefore, is only accessible on foot or by car. However, the new front entrance door would provide level access into the property, and the new ground floor ensuite bedroom would allow use by guest for whom stairs are a problem.

The driveway to the house provides vehicular access to the front door.

There are two buses a day that in each direction, running between Arundel and Worthing that serve the village and pass this property.

~~Robinswood, The Street, Patching, West Sussex~~

~~Design, Access and Heritage Statement~~

~~CONCLUSION~~

- a. Prior to preparing this planning application some informal advice was sought from the duty planner (Claire Forest) at Arun District Council on 4 April 2008.
- b. We believe that the proposal will add to the quality of the existing building. The main house is an attractive example of the architecture of its period, but has been spoilt by unsympathetic extension and alteration. The new extension, linked to main house with a flat roof, will remain subservient to the main house, as did the original northern extension – see Fig 8, below. The simplicity of the proposed extension will enhance the existing house and by replacing the rather drab concrete tile hanging with unpainted timber; it will create a more cohesive building, by tying the new extension into the existing using a material suited to this wooded site.



Fig 8

- c. The net gain in built footprint is modest, taking into account the removal of the garage, existing sitting room and office, summer house and large shed.
- d. The new extension and the works to the existing house will also considerably improve the energy consumption of this property, not only by using alternative sources of energy, but also by increasing the insulation levels within the existing dwelling.

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Robinswood, The Street, Patching, West Sussex
Design, Access and Heritage Statement

Appendix A

Survey Report, January 2007.

Robinswood, Patching

Introduction

- 1.1 The Brief was to carry out a survey of the property with a view to establishing any essential maintenance work, advise on energy saving methods and outline any desirable improvements to the property.
- 1.2 A measured survey was carried out on Wednesday 22 November 2006, which was in essence to form a basis for assessing the most viable means of reducing energy consumption. Consequently internal layouts may not be entirely accurate and so the drawings created as a result should not be used for any other purpose.
- 1.3 At the same time that the measured survey was undertaken, a general examination of the building was made including the two main roof spaces over the original house and the lounge and bedroom extension. No access was possible to the roof over the single storey, north east extension.

2.0 General Description

- 2.1 The property is located on the southern edge of Patching village, just to the north of the A27. The property is detached and stands within a large garden, which includes a number of large trees, including some specimen trees.
- 2.2 The property enjoys views over the open fields to the south.
- 2.3 Although foul drainage was originally to a cesspit, there is now mains drainage running through the field beyond the south boundary and the drainage discharges into that system.
- 2.4 The house is generally two-storeys, under an asymmetrical pitched roof. Since it was originally built in the 1977, further extensions have been added, including a first floor extension over the lounge to the south, providing an enlarged master bedroom with en-suite bathroom, a garage to the west and the conversion of the original garage into living accommodation. The drawings for the first floor extension (dated 1989) do not show the first floor layout as it is and so should be treated with some caution, as they may have been an earlier scheme that was never implemented.
- 2.5 Externally, much of the building is in fair-face brickwork, with green tile-hanging above. On the southern part of the lounge, the ground floor is finished with stone, again with green tile-hanging above.
- 2.6 The ground floor of the house is mostly concrete, although there appears to be a small area that is timber in part of the kitchen, where the utility room was in the original design. The floor of the lounge is on split-levels.
- 2.7 The floor finishes are currently mainly carpet with vinyl sheet in the kitchen. Lifting the corner of the carpet in a number of areas revealed that the hallway has a timber parquet floor, with ceramic tiles in the glazed porch area. The condition of both the timber and the tiles could not be accurately assessed without completely removing the carpet.

Robinswood, Patching**3.0 General Condition**

- 3.1 The main core of the house appears to be in sound condition. There appear to be no significant cracks and only one small patch of damp was seen (above top of staircase) and will need to be checked out if and when any works to insulate this area of roof are implemented (see below).
- 3.2 Externally, the walls are mostly quite sound, apart from the top of a brick pier in the south-east corner. The pier stops below the tile hanging and has been finished with a lead cap. The brickwork has cracked slightly at the top of this pier, but this is not thought to be serious and could be easily repaired.
- 3.3 Adjacent to this pier, the bottom timber batten under the tile hanging has dropped slightly and although this is probably not serious, some investigation should be undertaken by removing some of the tiles. This would need the services of a contractor to remove some of the tiles and then replace them.
- 3.4 The westernmost part of the property is the garage, which is a later addition. This flat roofed building abuts the house at the eaves of the main roof slope. It would appear that this building was not built on adequate foundations, as there are three very significant cracks. One is in the west wall and the other two are in the head of arches that form the entrance to the passageway. This suggests that the garage has settled unevenly.
- 3.5 Access was possible into the two main roof areas and there were no obvious signs of woodworm or other infestation, however a closer inspection should be made when any insulation is added to the roof spaces.

4.0 Energy Heatloss

- 4.1 The existing heating and hot water is provided by an oil-fired boiler. The oil tank being located on the north side of the house. The house is then heated by conventional panel radiators.
- 4.2 Many, but not all of the windows have been replaced with uPVC frames and double glazed. However, in many cases, because the sealed double glazed units have been installed into the existing softwood windows, the air-gap within the units is minimal. Therefore, only the new uPVC windows are really effective in reducing heatloss.
- 4.3 The roof space over the main house has very little insulation. The original drawings specified 25mm, which was common at the time the house was built, but in some areas this has now compacted to almost nothing.
- 4.4 The roof space over the southern section of the house, the first floor of which was a later extension, has much better loft insulation, with 100mm between the joists.
- 4.5 The roof over the staircase and landing and also the roof to the west-facing dormer are more difficult to insulate. It is considered, from the drawings, that there may be a nominal 25mm of insulation provided in these areas.

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- 4.6 The roof space over the former garage, now a small sitting room and study is not currently accessible. We would not advise having areas of a building that cannot be accessed and so it is recommended that a loft hatch be installed to provide permanent access into this area.
- 4.7 The ground floor of the house appears to have cavity walls with a cavity of approximately 75mm. There is not thought to be any insulation within the cavity. Certainly none is shown on the original drawings, and there is no evidence of more recent cavity fill having been undertaken.
- 4.8 The first floor walls are detailed on the original drawings as being solid blockwork with tile hanging externally. The first floor of the southern extension (the master bedroom and en-suite bathroom) is probably dry-lined on solid blockwork, although no drawings have been provided showing construction details. Limited exploration through an electrical socket produced evidence of some insulation material in the master bedroom, but it is not known the extent or thickness provided. The dimensions suggest that the battens that support the plasterboard are approximately 50mm deep and so there is almost certainly 50mm of insulation. This, and the existence of a reasonable thickness of roof insulation, would explain why this room appears much warmer than the others.
- 4.9 The ground floor rooms formed out of the former garage appear to have solid external walls, or possibly with a small cavity. The original garage was a single skin wall and the process of converting it to living accommodation appears to be simply adding masonry to make the walls flush between the internal piers. It is thought that there is probably no insulation within this area.
- 4.10 The existing radiator system is not working to its optimum level and some maintenance would appear to be necessary. We would recommend that a competent heating engineer is employ to overhaul the system, flush it and re-fill it, including rust-inhibitor and then new thermostatic radiator valves fitted to each radiator. For future reference, thermostatic radiator valves should always be opened to their maximum setting when the system is not being used – ie in the summer months or prolonged periods of vacation if the heating is not left on.

5.0 Energy Saving Measures

- 5.1 The primary heat source is currently oil. There is no gas in the vicinity and so of the main, conventional fuels, oil and electricity are the only options available.
- 5.2 The existing Trianco boiler ceased production in 1993 and so it must be at least 13 years old and possibly more. No figures are available on its efficiency, as the relatively new SEDBUK efficiency ratings had not been introduced. There is a balance to be struck when considering sustainability, between the lack of efficiency of the appliance and replacing something that is still working well. It is recommended that a CORGI registered engineer advises on the longevity of the boiler. A new oil-fired boiler (15 – 26kW) is likely to cost in the order of £1,750 - £2,000. This is likely to be significantly more efficient than the existing boiler. An accurate sizing for this boiler must be obtained before placing an order.

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- 5.3 Certainly, under current regulations, when the boiler is replaced it will have to be replaced with a condensing boiler and now that SEDBUK ratings exist, it would be essential that a boiler with the highest possible efficiency be installed. Boilers giving between 93% and 97% are now available.
- 5.4 An alternative heat source would be to change from an oil-fired boiler to a Biomass boiler. This is a boiler that uses wood pellets, wood chips or straw, etc. These boilers are gaining in popularity given the desire to reduce the reliance on fossil fuels and are very efficient. There does need to be adequate storage for the fuel and also availability of fuel locally. One consideration on this item would be need to manually fuel the boiler – this could be an issue with lifestyle implications, if long periods of absence are necessary. The cost of a biomass boiler installation depends on a number of things, but is likely to be in the region of £4,000 – £5,000. With the right equipment, it is possible to make the pellets oneself.
- 5.5 Given that there is a fireplace and chimney serving in the living room, the space heating could be supplemented with a wood-burning stove. These can be obtained to heat the water in a similar fashion to the old style back-boiler. They are fairly simple to install and simply need a flue and a pipe connection to the hot water cylinder. The prices of such stoves vary considerably depending on the aesthetics, but can be anything from £1,200 to £3,000 plus the cost of installation. Some stoves can use paper pellets, which you can make yourself from old newspapers using a pressing machine.
- 5.6 The lack of insulation is certainly the first thing that must be addressed. The loft insulation in the original section of the house should be increased to at least 250mm, as the joists are only 100mm deep, this should be done by laying 100mm between the joists and 150mm across the top at right angles to the joists. However, it should be noted that this does make the use of the loft space for storage impractical and potentially dangerous for walking into as the joists are concealed. Ventilation needs to be introduced to both eaves and possibly the ridge, to reduce the risk of condensation forming within the roof space.
- 5.7 The insulation over the master bedroom area is clearly doing a good job, but increasing it to 250mm by laying 150mm over the top of the existing insulation, at right angles to the joists, would improve the situation greatly. There are already eaves ventilation provided, but it should be checked for compliance with regulations and it necessary more introduced or ridge ventilation added.
- 5.8 Insulating the roof over the staircase and landing and also the dormer window, is more difficult, as simply to fill the voids with insulation could lead to condensation problems, especially in the bathroom. Consequently, it is recommended that a more ambitious scheme be undertaken, which would include recovering the dormer roof and also removing and re-felting the roof over the stairs and landing, to ensure that adequate ventilation is possible to dissipate any moisture. Such a scheme needs to be designed and specified.
- 5.9 Grants are currently available and we would expect that given the very small amount of insulation in the main roof, a grant would be possible. Detached houses can currently obtain loft insulation with the householder paying a contribution of £250.

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- 5.10 The roof over the former garage (now the small sitting room and study) is likely to have little or no insulation. This should also be addressed and at least 150mm added, but a final decision on the amount needs to be taken once access is possible. Again, eaves cross ventilation will be necessary.
- 5.11 Cavity wall insulation should also be considered. Significant grants are currently available and a detached house can obtain cavity wall insulation for a contribution of £269. A survey by a reputable insulation company should be undertaken first. This would improve the whole of the ground floor. It does not seem that the first floor could be so insulated.
- 5.12 The first floor external walls, could be improved by introducing insulation behind the external tile-hanging. This would involve removing the tiles, introducing vertical battens with counter-battens, insulating between the battens and then replacing the tiles. This would alter the detailing slightly, but is achievable. This is a relatively expensive operation and so has not been allowed for in the heatloss calculations upon which this report is based.
- 5.13 The walls of the former garage are likely to be solid, or at least to have only a small cavity. This makes insulation difficult to achieve. There are two ways of addressing this. Firstly, the walls could be dry-lined with plasterboard on battens and insulation placed between the battens, or secondly, the exterior of the walls could be covered in insulating render (render on top of insulation). The former is much more disruptive internally and will reduce the size of the rooms. The latter involves no interior disruption, but would alter the external appearance of the property.
- 5.14 Improving the insulation in the ways described is likely to reduce the energy consumption of the house by approximately 55-60% (excluding any allowance for insulating behind the tile hanging). This is based on similar calculations of heatloss for the house as it is and then comparative calculations with the new insulation. This level of reduction is based upon like conditions being compared, and will be subject to variation when comparing mild and severe winters.
- 5.15 Clearly, other factors could affect this reduction such as comparing an exceptionally clement winter with the present levels, compared to a very severe winter with the insulation.
- 5.16 Most of the windows have been replaced with double glazed units, however, some are still single glazed and some have a very small air-gap. It is recommended that the single glazed units be replaced with double-glazing and that in due course, the windows with small air-gaps are replaced with new windows that can accommodate a large gap. In all cases Low-E (low emissivity) glass should be used in new glazing and if any existing double-glazed units need replacing they should have Low-E glass in them (other glass may be available by the time such replacement is undertaken. The target U-value for the glass should be 1.3 – 1.8W/m²K, or better). If there is a desire to take a sustainable approach in the work to the property, then consideration should be given to using timber window frames rather than uPVC, which is not a sound material from a 'green' perspective.

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- 5.17 None of the roof slopes are south-facing and so it is not an ideal property for solar thermal panels or photovoltaic cells. However, they would still work and might be considered.
- 5.18 Solar thermal panels could be installed on the top of the large, west-facing roof slope. Whilst they would catch slightly less of the sun's rays than they would if facing south, they should still achieve some significant results and top up the domestic hot water system, thereby reducing the demand made on the boiler. The cost of an installation for this property would possibly be in the order of £3,500 to £4,500.
- 5.19 Photovoltaic arrays (PV's) convert the sun's rays into electricity. However, they are quite expensive and in a domestic situation, it is normally considered that solar thermal panels are more appropriate. However, if PV's were installed, provided the current energy supplier agreed, surplus electricity (when on summer holidays for example) can be sold back to the national grid. The cost of PV's is higher than Solar Panels and likely to cost closer to £7,000.
- 5.20 Ground Source Heat Pumps are another means of reducing the energy consumption. These use the heat within the ground to raise the water temperature. There are two basic types of installation. One is the open-loop, which extract heat from ground water. This is drawn from a drilled well and pumped to a heat pump, where the heat is extracted (or rejected in cooling mode). The used water is released back into the ground, so that the system only extracts the heat and does not pollute. This system is dependent on geological conditions and the availability of water beneath the ground. This would need to be tested and validated by a detailed geotechnical survey and trial borehole. The closed-loop draws heat from the ground using multiple continuous loops of plastic pipe that are either inserted into a borehole contained within a structural pile casing, or looped horizontally 1m or more below the surface of the ground. The latter is more common for domestic installations, as it is space intensive. In the case of a borehole system, these can be anything from 20 to 250m deep. GSHP can be quite an efficient means of supplementing the reliance on conventional fuels, where there is space to install them.
- 5.21 Given the wooded nature of the site, we consider that a borehole system would be most appropriate and would result in less disruption to the garden. However, the cost of such an installation is likely to be in the order of £25,000 - £30,000.
- 5.22 A ground source heat pump can be used with a radiator system, but the greatest efficiency is achieved when it is used with underfloor heating. The highest flow temperature that a GSHP is likely to reach is 45°, whereas a radiator system requires 65-75°. With a radiator system, one unit of electricity to power the heat pump will produce 2.5 – 3 units of heat output (Coefficient of Performance – CoP), whereas with underfloor heating, 1 unit of electricity will produce 3 – 4 units of heat output. The electricity used to power the pump could be provided from photovoltaic cells. Some of the specialist contractors we spoke to would not install a GSHP without underfloor heating.

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- 5.23 Wind power is another possibility. However, the UK Windspeed Database suggests that the windspeed on this site is not great enough to make this a viable solution and also the wooded nature of the site and surroundings would make the siting of a turbine almost impossible. Domestic scale wind turbines are available from 600W upwards. The cost of a 2.5kW turbine would be in the order of £13,000, plus the cost of the concrete base. Such a turbine would be at least 6.5m above the ground and possibly nearer to 11m. The advice from the Centre for Alternative Technology is that for customers already connected to the national grid, PV's are more viable than a wind turbine.
- 5.24 As and when it is necessary to replace household appliances, such as refrigerators, freezers and washing machines, it is recommended that these be replaced with the highest possible energy efficiency rating (A or B).
- 5.25 Other aspects of sustainable design such as water conservation are also important considerations. This has been highlighted by recent hot summers and consequential hosepipe bans. If watering of plants is a consideration, then certainly simple rainwater collection using rainwater diverters in downpipes and collecting the water in water butts should be considered. However, the harvesting of rainwater for flushing toilets etc. is probably not a viable option for an existing dwelling, given the cost of installing a suitable tank and a secondary distribution system within the house.
- 5.26 However, a more practical and sensible solution would be replace existing toilet cisterns with a smaller capacity (say 4.5 litres, instead of the old 9 litre) and also with dual flush, so that there is the option of a light or a heavy flush. Similar water saving devices can be fitted in taps.

6.0 Recommendations

- 6.1 That the roof insulation in the main, original part of the house be increased to at least 250mm, together with the required eaves ventilation. The insulation must be installed in such a way as to maintain a cross-flow of air.
- 6.2 That the insulation in the newer section of roof be increased by laying a further 150mm over the tops of the joists. The amount of ventilation provided to the eaves should be confirmed as being in accordance with the current requirements and if necessary increased. The insulation must be installed in such a way as to maintain a cross-flow of air.
- 6.3 That a permanent roof access hatch be installed in the ceiling of the small sitting room (former garage).
- 6.4 That roof insulation is provided in the roof of the small sitting room and office, again to 250mm, together with eaves ventilation. The insulation must be installed in such a way as to maintain a cross-flow of air.
- 6.5 That consideration is given to rendering the exterior of the small sitting room and office, including external insulation. There are several companies who manufacture such systems.

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- 6.6 That consideration be given to removing the existing tile-hanging to the first floor walls, increasing the batten size and insulating between the battens before replacing the tiles.
- 6.7 That the existing garage be demolished and if required a new garage designed elsewhere in the garden.
- 6.8 That the existing single-glazed windows be replaced with double-glazing.
- 6.9 That the carpet in the hallway be uplifted and the timber flooring inspected, renovated and polished.
- 6.10 That the existing ceramic tiles under the carpet in the porch area be reviewed and possibly replaced with slate tiles or similar.
- 6.11 That alternative energy sources be considered. We would suggest that the most viable option is to install solar thermal panels to heat the hot water.
- 6.12 That consideration be given to a new, oil-fired condensing boiler, which would be far more efficient than the existing one and with the increases in insulation levels recommended, could be smaller in size. The size of the boiler should be confirmed by a competent engineer, having regard to hot water and heating requirements. Alternatively, that a Biomass boiler be considered.
- 6.13 That the installation of a wood-burning stove in the living room be considered, including the choice of one that can heat the hot water.
- 6.14 There is a slight concern over the tile hanging on the south east corner of the building, where the timber batten has dropped. Whilst it is not considered to be of major concern, it would be useful to employ a contractor to remove a few of the tiles so that a closer inspection can be made.

7.0 Notes

- 7.1 The design of any new installations, such as solar panels, ground source heat pumps and boilers etc., should be designed by competent engineers.
- 7.2 The figures referred to in this report are based on assumed data in respect of building construction. Whilst the assumptions made are considered reasonable, we cannot guarantee the detail. Heatloss values for materials, such as concrete blocks manufactured in the 1960's and 70's have been assumed, as that information is not available.
- 7.3 All forms of alternative technology can be eligible for grants under the Low Carbon Buildings scheme, but this information changes regularly. Also, some energy suppliers (ie. electricity companies, etc) have 'green funds' and can make grants against the cost of installing alternative technologies, particularly in respect of electricity, because when the householder is producing excess energy (whilst on holiday for example) the surplus electricity can be sold back to the national grid.

Robinswood, Farning

- 7.4 Planning Permission would be necessary for a wind turbine and if the property is within a Conservation Area, then permission is likely to be necessary for the Solar Thermal Panels or Photovoltaic Panels and the rendering of the northern extension. The demolition of the garage and the provision of new garage would also require planning permission.
- 7.5 In preparing this report we have not undertaken any intrusive investigations, apart from lifting small areas of carpet in discreet areas.

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