ENERGY STATEMENT

FOR CONVERSION OF

EXISTING BUILDERS STORE TO 3 BED RESIDENTIAL DWELLING

AT RED ROCK BARN, TICKENHAM HILL, TICKENHAM
For Karen Jacquest & Gary Traviss

Sustainable Drainage System and Water Conservation

Surface Water

All surface water from roofs will be routed to soakaways via rainwater collection tanks.

All hard landscaping surrounding the dwelling will be semi permeable.

Recycling and Reducing of Building Waste/Materials

The project is designed to reuse the existing Builders Store with very little alteration to its construction, other than two new rooms, one to the East elevation and one to the South.

The existing pre-made engineered roof trusses will be retained.

Removal of Concrete Apron in front of building and any existing concrete block work removed for fenestration will be crushed and reused for base of semi permeable hard landscaping.

The existing double roman clay tiles are 150 years old. The pitch of the Builders Store roof is too shallow for the old double roman tiles to be reused; they are not interlocking and there would be water ingress. It has been decided to replace them with new double roman interlocking clay tiles in keeping with the surrounding properties. The existing tiles will be retained by the owners for the use on Red Rock Barn which has a roof spanning 100ft and in need of many original double roman tiles as replacements for the maintenance of the roof. It is difficult to source them due to the many different profiles, shapes and sizes of these very old tiles.

An existing stock of facing stone and reclaimed clay bricks on site will be sufficient to face the existing block walls on South and West Elevations (as per plans)

Location and Internal Design

The proposed dwelling is reusing an existing Builders Store and as such the location and orientation on the site is already fixed.

Within these limitations the internal design has however been considered with energy saving in mind. The main day time living area is within the south facing elevation. All the windows/doors for this area are on the south side of the property to maximise light. Bedrooms are either north or east facing allowing for cooler sleeping in summer. The underfloor heating in winter being generated from renewable energy.

Excessive solar gain in summer is not anticipated. If measures are required they may include external shading. Natural ventilation and secure ventilation for night cooling are already in place.

Heating

Underfloor heating will be installed using a Schluter-Bekotec system. Underfloor heating operates at a much lower input temperature due to its greater surface area compared to radiators. It can be as low as 25°C compared to 70°C for radiators. UFH is also more efficient due to the way it operates being radiant heat distributed throughout the room as opposed to convection heat from radiators which relies on convection to distribute the heat leading to cold spots in rooms. UFH systems are estimated to save up to 40% energy.

The entire property being a bungalow will benefit from this system which will be wholly run on the hot water generated by the air-source heat pump.

Hot Water

The hot water for the heating and domestic use will be generated by an Air Source Heat Pump.

Electricity

PV Panels will be fitted to generate electricity.

Building Regulations

All the thermal requirements are in line with current building regulations. Full SAP calculations have been provided which will demonstrate compliance with current standards.

Natural Ventilation and Lighting

All window to have openings and trickle vents to assist with natural ventilation. The location of the windows in daytime living space to be mainly south facing which will maximise natural light.

Construction Techniques

All insulation will be up to or surpass Building Regulations and thermal bridging techniques will be properly applied and documented.

Building Sustainably for the Future

The scheme shows consideration of the need to use materials with a reduced energy input – for example the re-use of existing buildings, on site materials and recycling of materials and the installation of renewable energy systems.

Renewable Energy

PV panels on the roof will be installed to provide renewable electric energy.

An Air Source Heat Pump will be installed to provide hot water for underfloor heating system and hot water for domestic use, showers etc. An Air Source Heat Pump is the most suitable renewable energy system for the generation of hot water is this instance. The ground conditions, are not suitable for a

Ground Source Heat Pump and a Wind Turbine would negatively impact the surroundings and the neighbours and in addition the windspeed in this area is under the advised minimum.

Summary

The project has been designed around reducing energy use, both in construction and habitation.

Please see table below for further detail and evidencing.

	Energy Demand (KWh/PA	Energy Saving Achieved (%)	Regulated Co2 Emissions (Kg/PA)	Saving Achieved On Residual CO2 Emissions (%)
Baseline Part L Compliance	5454	N/A	737	N/A
Residual Emissions Proposed Scheme After Energy Efficiency Measures & CHP	4914	10%	468	37%
Proposed Scheme After On Site Renewables	3455	30%	289	38%
Proposed Scheme Offset For Financial Contribution or Other Allowable Solution	N/A	N/A	N/A	N/A
Total Savings on Residual Emissions	1459	27%	179	24%

The above Energy Statement table compiled by:
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