

Sustainability/ Energy Efficiency Statement

**Proposed
Four Residential Properties**

At

**Land adjacent to Wayside
Eastergate, Eastergate Lane
PO20 3SJ**

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Prepared by

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Sustainability / Energy Efficiency Statement

The proposed development is for four detached homes to the land adjacent to Wayside, Eastergate Lane, Eastergate PO20 3SJ. The proposed homes will be constructed to Code Level 3 of the Code for Sustainable Homes. The Code for Sustainable Homes covers nine categories of sustainable design:

- Energy and CO2 Emissions
- Water
- Materials
- Surface Water Run-off
- Waste
- Pollution
- Health and Well-being
- Management
- Ecology

1. Energy and CO2 Emissions

A] Dwelling emission rate (M)

The DER is the estimated CO₂ emissions per sqm per year (KgCO₂/msq/year) for the dwelling as designed. It accounts for energy used in heating, hot water and lighting. The dwelling emission rates (DER) will be designed to provide 25% reduction in the DER over the Target Emission Rate [TER].

B] Fabric energy efficiency (M)

The houses will be constructed of traditional, locally sourced materials to reflect the local vernacular. The construction will provide 25% improvement in thermal insulation whilst retaining the local vernacular style. The development will include alternative sources of energy to meet the Code Level 3. This will be achieved by introducing Photovoltaic cells (to south elevations) and air source heat pumps to the four units. Low energy lighting to each unit to be in excess of 25% required to meet the current building regulation standards as required by Part L1A.

C] Energy display devices

This system comprises of a self-charging sensor fixed to incoming mains supply, to measure and transmit energy consumption data to a visual display unit (smart meter) As a minimum the visual display unit will display the following information:

- Local Time
- Current mains energy consumption (kilowatt hours)
- Current emissions (g/kg/CO₂)
- Current Tariff
- Current cost (in pounds and pence)
- Display accurate account balance information (amount in credit or debit)
- Visual presentation of data (i.e. non numeric) to allow customers to identify high and low level of usage.
- Historical consumption data so past comparisons can be made.

D] Drying Space

Within the private amenity space of each garden space adequate drying space will be provided. This will reduce the need for drying clothes via a tumble dryer. Drying will be provided by a rotary clothes airer located with the amenity space.

E] Energy labelled white goods

The energy label rates products from A (the most efficient) to G (the least efficient). For refrigeration, the scale now exceeds A++. It is a legal requirement for the label to be shown on all refrigeration and laundry appliances, dishwashers, electric ovens and light bulbs packaging at point of sale.

White good supplied for the project will follow the standards below:

- Fridge and Freezer, fridge/freezer A+
- Washing Machine & Dishwasher A
- Washer Dryer & Tumble Dryer B

F] External Lighting and Power

Maximum 150W with PIR security lighting with daylight cut off

Two car charging points included to each dwelling. Each charging point is OZEV Approved and can be monitored via an intelligent smart app.

G] Low and zero carbon technologies

Technologies eligible to contribute to achieving the requirements of this issue must produce energy from renewable sources and meet all other ancillary requirements. Where not provided by accredited external renewables there must be a direct supply of energy produced to the dwelling under assessment. The incorporation of Photovoltaic energy supply to each unit will produce energy for each unit (see calculations within this document). Air Source Heat Pumps [ASHP] to the four units will be included. All technologies implemented must be accounted for by SAP.

H] Cycle Store

Easy and direct access from/to the dwellings. Safe and secure weatherproof storage of bicycles to each dwelling. This will reduce air/noise pollution. Each dwelling has a double garage which will provide secure storage.

i] Home Office

The following services will be provided in a suitable room intended as a home office:

- Two double power sockets
- Two telephone points (or double telephone point) or one telephone point where cable or broadband is available.
- A window (Note: The room chosen to be the nominated home office must have a daylight factor of at least 1.5%)
- Adequate ventilation

2. Water

A] Indoor water use (M)

This is to reduce the consumption of potable water in the home from all sources, through the use of water efficient fittings, appliances and water recycling systems. The dwellings will incorporate:

- **Delayed inlet valves**

To prevent water entering the WC cistern until it has completely emptied, enabling a precise volume of water to be discharged independent of water pressure.

- **Flow Restrictors**

Flow restrictors contain precision made holes or filters to restrict water flow and reduce outlet flow and pressure. They are typically fitted within the console of the tap or shower heads, or at the mains inlet to the dwellings.

- **Ion exchange water softeners**

These remove the agents causing hard water by passing water from the mains through resin. The resin must be regenerated regularly. The water consumed during the regeneration depends on the hardness of the water (this varies geographically) and the efficiency of the water softener

- **Low Flush WC's**

Designed to reduce the volume of water consumed during flushing. The project will incorporate either delayed action water inlet valves or dual flush cisterns which provide a part flush for liquids and a full flush for solids. The systems will be matched to suitable WC' pans and must pass the discharge performance requirements of BS EN 997:2003 FOR Class 2 WC suites.

- **Rainwater recycling**

Rainwater will be collected from hard outdoor roof finishes to feed rainwater butts which will reduce the demand for watering garden plants etc from potable water.

B] External water use

The limited size of the scheme does not warrant grey water recycling to reduce potable water requirement. Rainwater will however be collected from hard outdoor roof finishes to feed rainwater butts which will reduce the demand for watering garden plants etc from potable water.

3. Materials

A] Environmental impact of materials (M)

It is proposed to use materials with lower environmental impact over their lifecycles. Following the Green Guide to Specification see the ratings below of the proposed elements of the building fabric.

- | | |
|--|----|
| • Roof | A+ |
| Plain Clay roof tiles, breather membrane roofing battens and insulation | |
| • External Walls (Type A) | A+ |
| Cavity wall construction Brickwork / cavity insulation / thermal blockwork | |

- External Walls (Type B) A+
Cavity wall construction Feather edge board breather membrane/
Treated battens blockwork / cavity insulation / thermal blockwork
- Internal Walls B
Blockwork or timber stud /insulated
- Ground Floor Construction B
Beam and block floor (grouted) with aircrete block flooring, insulation
and screed (underfloor heating to selected areas within screed)
- First Floor Construction A+
18mm Chipboard on timber joists with acoustic insulation
- Windows A
Pre-treated softwood windows

B] Responsible sourcing of materials – basic building elements

The following basic building elements; Ground Floor, First Floor, Roof, External Walls, Internal Walls, Foundations, will where possible be sourced from responsible suppliers with 100% of any timber elements being legally sourced.

C] Responsible sourcing of materials – finishing elements

Finishing Elements will be responsibly sourced including internal doors, skirtings / architraves and staircases.

4. Surface Water Run-off

A] Management of surface water run-off from developments (M)

The proposed development will incorporate soakaways to each dwelling from rooflines and garden patios. This will assist the base criteria that the peak rate of run-off is no greater than it was pre development. Permeable paving will be incorporated to the driveways or they will be laid to fall to drain and soakaway or discharge onto grassed areas adjacent to the hardstanding.

B] Flood Risk

This site is a low flood risk area due its location

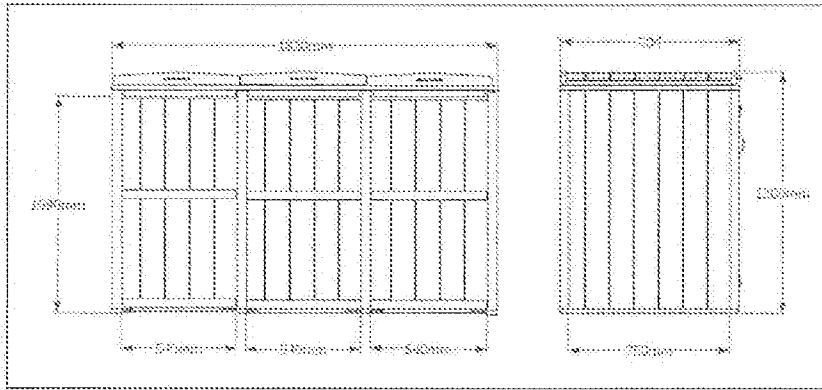
5] Waste

A] Storage of non-recyclable waste and recyclable household waste (M)

The proposal provides internal and external areas available for the storage of non-recyclable and recyclable waste, within the kitchen/utility area internally, and adjacent to the rear door externally.

The size, type and number of containers are as required by the local authority's waste management programme and to comply with Part H of the building regulations for the storage of waste.

The houses will also have dedicated triple bin stores constructed from timber boarding to give an aesthetically appealing storage area.



180 Litre
Bin Chest

The Developer will seek to make practical use of recycling boxes, composting bins and residual waste bins for each unit. This will in turn reduce the amount of household waste that has to be sent to landfill.

Waste Audit:

This statement is to be read in conjunction with the Full Planning Application for 4 residential properties.

The statement has been prepared in accordance with the Waste Core Strategy. This deals with waste production and handling on a site and it seeks to ensure that wastes are being handled and store in a safe environmentally acceptable manner at a reasonable cost.

Planning Policy - Waste Strategy 2007 for England:-

This document describes the Government's vision for managing waster and resources in accordance with the EU waster Framework Directive. A key objective of the strategy is to decouple the link (in all sectors) between economic growth and waster arisings. Key elements in achieving the aims of the strategy include:-

- Incentivising waste prevention, reuse and recycling
- Regulation reform
- Targeting specific materials, products and sectors
- Stimulate the market
- Improve governance

National Planning Policy Statement 10 (PPS10):-

This sets out the Governments policy to be taken into account by waste planning authorities. Local Authorities are now under obligation to better integrate Waste Management within their policies.

Waste is managed in a hierarchy (prevent, reduce, reuse, recycle and dispose) unless other more environmentally sound alternatives are suggested. Waste minimisation is essential with an aim of not reducing the quantity of waste in the first place and reducing the quantity of waste.

The principles of waste minimisation are:

- To design proposals sustainably
 - To reduce the amount of waste generated from development
 - To conserve natural resources through re-using waste arising from construction
 - To re-use waste materials on-site to reduce transportation
 - To use recycled materials where possible
-
- To reduce waste generation during the operational lifetime of the development
 - To Facilitate recycling where waste does arise

Proposed Design:-

The proposed scheme has been designed to reduce as much as feasibly possible the generation of waste during site clearance and throughout the construction phase of the design. Elements of the build can be sourced locally to avoid long distance delivery requirements. The construction techniques will encourage the re-use of materials and the segregation of materials for recycling wherever feasibly possible. Site access will enable ease of access for vehicles that can collect reusable waste and for skip waste.

B] Construction site waste management

The development will adopt a waste management plan and the developer will endeavour to follow the following criteria:

- The use of pre-mixed mortars
- Pre-fabrication of components where possible
- Just in time delivery to reduce material storage
- Use of re-useable delivery bags and palletised delivery of materials

The control of the amount of waste produced will be managed carefully by the main contractor. Excavations will be kept to a minimum and in compliance with the requirements of building control, this will also be cost effective. Site materials will be carefully estimated to ensure no over ordering of materials. With the proposed development there will be some removal of topsoil arising from foundation excavations and the construction of the four new residential properties and garaging, complete with driveway, turning area.

C] Composting

The development will include composting facilities for normal domestic, non woody garden, food and other compostable household waste. Instructions as to their correct use will be left with the new occupier.

6. Pollution

A] Global warming potential (GWP) of insulants

The specified insulation materials will be from manufactured products using low blowing agent emission techniques, namely Kingspan with an overall rating of A+

B] NOx emissions

The development will not produce NO2 products as there will be no log burning fires included.

7. Health and Well-being

A] Daylighting

The rooms have been designed and orientated to provide a good level of natural daylight throughout the day and the year. A large percentage of the working planes in the; kitchen/dining room, and bedroom, study will receive direct light from the sky.

Affective daylighting will reduce the need for electric lighting and the aspect of the windows will assist with winter solar gain, thus meeting some of the needs on the heating requirements. There are no obstructing buildings which would diminish the amount of light received.

B] Sound Insulation

Sound Insulation will meet the requirements of Part E of the building regulations for the internal enjoyment of the occupants.

C] Private Space

The detached properties will provide ample external private amenity space for the well being of the occupants

D] Lifetime Homes (M)

The dwellings are not suited to lifetime home construction as the relevant criteria contained within the guide cannot be met in all instances.

8. Management

A] Home User Guide

The future occupier will be provided with a "Home User Guide" which details the operation and environmental performance of their home.

B] Considerate Constructors Scheme

We are unable to confirm if the development will be carried out by a contractor affiliated to the scheme.

C] Construction Site Impacts

See references to construction site waste management

D] Security

The development will provide levels of security in line with "Secured by Design New Homes"

9] Ecology

All aspects of Ecology will be covered by Lizard's Ecological Impact Assessment for the project.

Solar Calculations per house

Client Name:	Richard Smith
Site Address	Land Adjacent to Wayside Eastergate Lane, Eastergate PO20 3SJ

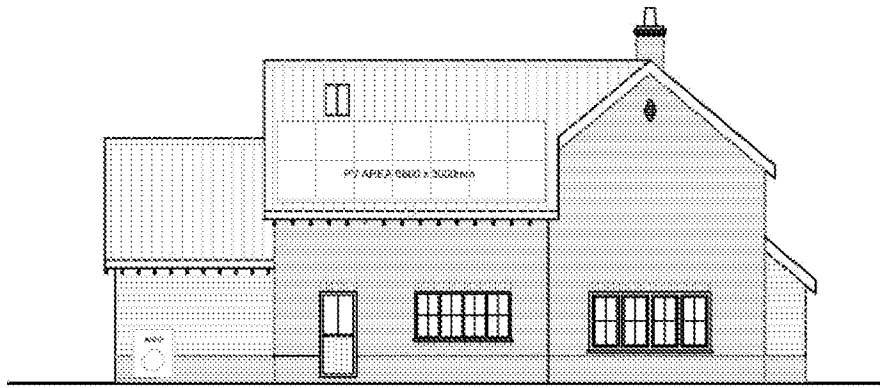
Project Reference	1194
Number of Panels	14
Output per panel (W)	300
Peak output (Kw) – number of panels x output	4.2
Roof Inclination	40 degrees
Gives an irradiation figure of	749
Shading factor (using accredited shading tool)	1
Provides a total annual yield of (kWh)	3146
Current Generation tariff (pence per kWh)	3.93
Therefore the Generation revenue is	£123.64

The government assumes that 50 % of generated electricity is exported back to the grid and pays fixed sum for the export tariff

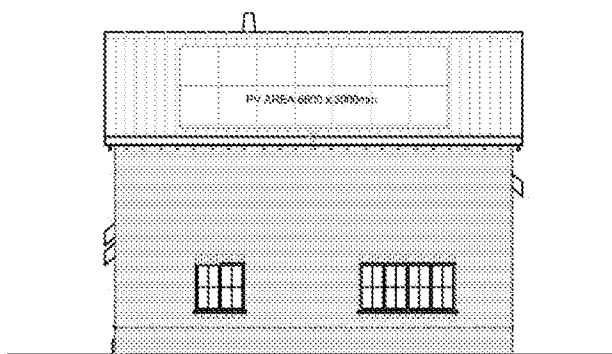
The current export tariff is (pence per kWh)	5.24
Therefore the Export revenue is	£82.43

If the remaining 50% of the generated electricity is used in the home, then the client will save the costs of importing it from the grid. Assuming a price of imported electricity at a rate of 14p per kWh, this will give a saving as follows:

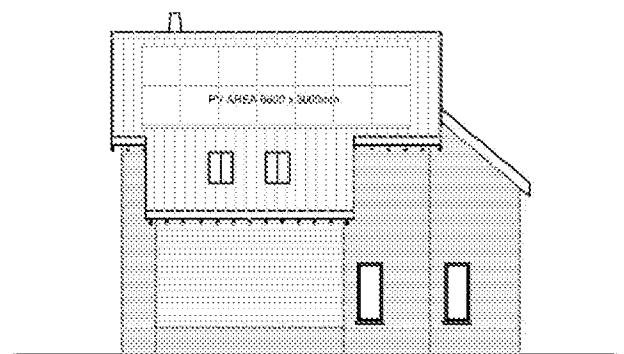
Electricity cost saving (assuming 50% exported)	£220.22
Total revenue (assuming 50% exported)	£426.28
If the fully installed cost of the array is	£6410.43
Then the number of years in which this will be paid back is	15.0



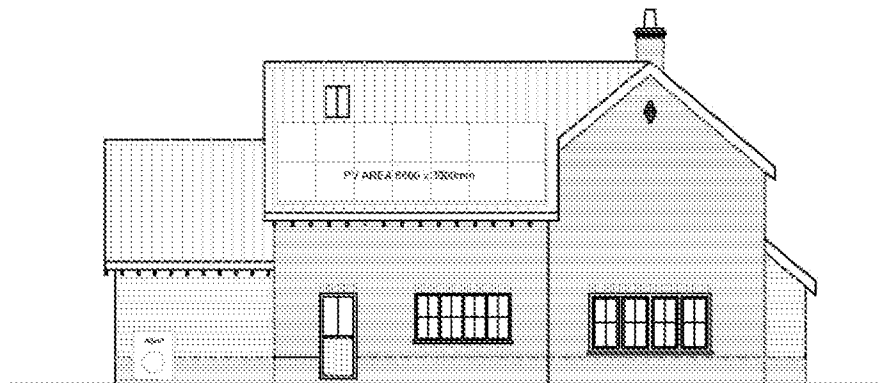
Unit 1 South Facing Elevation



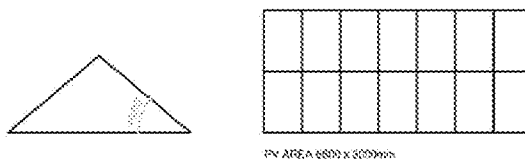
Unit 2 South Facing Elevation



Unit 3 South Facing Elevation



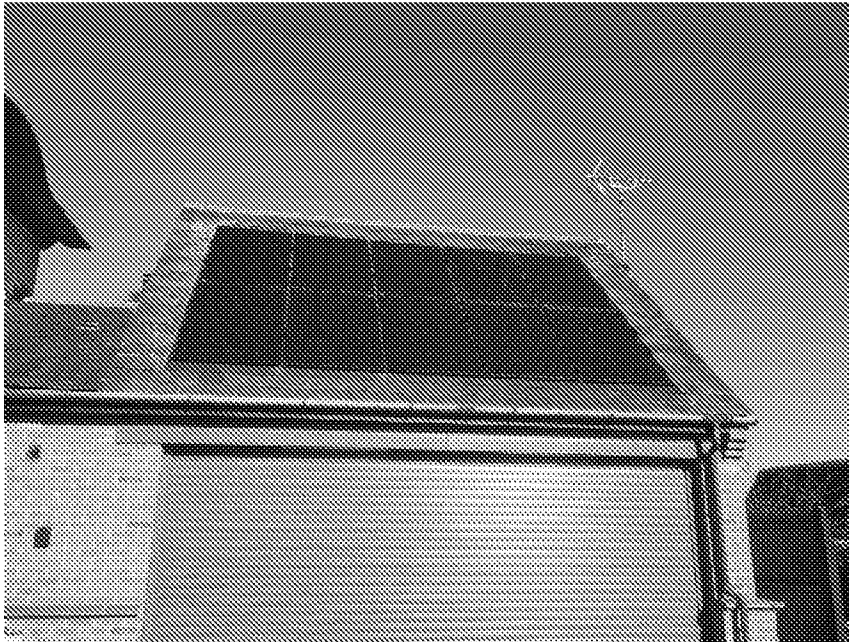
Unit 4 Side Elevation - View B



Module Type: JA Solar 300 W Mono Percium 5BB Black panels

Inverter: GROWATT 3600 MTL-S Dual MPPT Small – DC

Example Images



Visually the JA Solar 300 W Mono Percium 5BB Black panels give a slimline appearance and have little impact. As these will be fitted on the Southerly Elevations these have no impact on the street scene as they are either on the rear or side of the houses. Key elevations remain uninterrupted by Solar panels yet the application on the secondary elevations will provide significant energy efficiency to each unit. This combined with the introduction of air source heat pumps to each property will significantly enhance the energy efficiency of each property.

Water Use and efficiency

Our aim is to minimise the impact on the existing water resources, infrastructure and the environment. Where possible the house types will be designed so as to have a predicted water discharge of no more than 80 litres of water per person per day in line with the requirements of Level 5 of the Code for Sustainable Homes (CfSH). Our objective to achieve water efficiency by the following items:

A: Reduce Water Use, Efficiency Devices, Smart Metering, Water Saving culture.

B: Reuse Water, Rainwater harvesting.

A: Reducing Water Usage

A] Water Efficient Devices

To make the proposed residential properties more water efficient they will include water efficient devices and smart metering. Water efficient devices will be used for toilets, taps, showers and other household appliances. Toilets will have either a low flush below 4.5 Litres or dual flush 6/4 Litres. Taps will have a flow rate of 1.7 Litres / Min and showers a flow rate below 8 Litres / Min. It is our objective to ensure such sanitary goods are certified with a high rating from the European Water Label.

B] Smart Metres

Smart Meters to be installed to each property allowing the homeowners to see how much water they are using and how this will affect their water bill.

B: Water Reuse

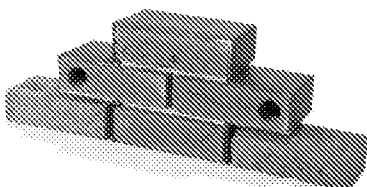
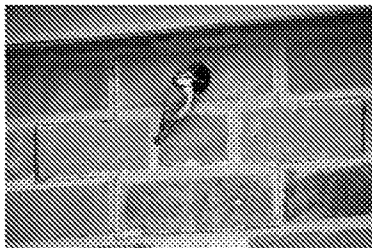
Rainwater Harvesting Systems will be incorporated into the drainage design for each property. These will capture and reuse the rainwater collected from the pitched roofs. Gravity fed systems will be used, in the form of a household above ground tank, useful for watering gardens. The systems incorporated will be designed to British Standard BS EN 16941 – 1:2018.

Integrated Bat and Bird Boxes

Integrated bat and bird boxes to be included within all dwellings

Built in bird boxes - by birdbrickhouses.co.uk

Bird boxes - sparrow boxes



Bat boxes -

