

Address
The Boathouse
Embankment
Putney
London
SW15 1LB

Telephone
020 3397 4452

Fax
020 3397 0036

Email
reception@ mavensustainability.com

Website
www.mavensustainability.com



ENERGY STATEMENT

for

26 CATEGORY II SHELTERED APARTMENTS

at

**LONDON ROAD
WATERLOOVILLE**

18th April 2012

CONTENTS

Executive Summary

- 1.0 Introduction
- 2.0 Planning Policies
- 3.0 Assessment Methodology
- 4.0 Proposal
- 5.0 Demand Reduction (Be Lean and Be Clean)
 - Passive design measures
 - Active design measures
- 6.0 Climate Change Adaption and Water Resources
 - Sustainable drainage systems (SuDs)
 - Water efficiency measures
- 7.0 Establishing Carbon Dioxide Emissions
 - SAP calculations
- 8.0 Renewable Energy (Be Green)
- 9.0 Proposal for Renewable and/or Low Carbon Technologies

APPENDICIES

- 1.0 Code for Sustainable Homes Pre Assessment Estimator
- 2.0 Renewables data sheets
- 3.0 Roof plan showing possible location of solar hot water panels

Executive Summary

This Energy Statement accompanies a detailed planning application for the redevelopment of the site at London Road/ Hulbert Road, Waterlooville to provide 26 Category II sheltered apartments comprising 1 and 2-bedroom accommodation. The Statement includes an energy demand assessment showing how selected energy efficiency and renewable energy measures have been incorporated into the development design.

Working drawings have yet to be progressed but SAP calculations have been prepared based upon the detailed planning drawings and an assumed construction specification.

The design philosophy follows the following hierarchy:

- Be Lean – using less energy, in particular by adopting sustainable design and construction measures
- Be Clean – supplying energy efficiently
- Be Green – using renewable and low carbon technologies

The total site energy demand is predicted as **119,224 kWh/year**.

It is proposed to install a total of 12 solar hot water panels to 12 apartments.

The energy saving from the use of renewables and/or low carbon technologies totals **12,510 kWh/year**, which equates to a contribution of **10.49%** of total demand.

The Statement demonstrates the policies of the South East Plan and Havant Borough Council are met.

The apartments will achieve Code for Sustainable Homes level 3.

1.0 Introduction

- 1.1 This report has been commissioned by Maven Plan and provides an Energy Statement for the proposed development on the site at London Road/ Hulbert Road, Waterloooville.
- 1.2 The report describes the methodology used in assessing the proposed development and the initiatives proposed.
- 1.3 The site will be designed and constructed to reduce energy demand and carbon dioxide emissions. The objective is to reduce the energy demand to an economic minimum by making investment in the parts of the building that have the greatest impact on energy demand and are the most difficult and costly to change in the future, namely the building fabric. Once a cost effective structure has been designed, renewable technologies will be considered for installation to provide heat and/or electricity.

The following hierarchy will be followed:

- Lean reduce demand and consumption
- Clean increase energy efficiency
- Green provide low carbon renewable energy sources

- 1.4 The report has been prepared by Maven Sustainability who are Sustainability Consultants, licensed Code for Sustainable Homes and Ecohomes Assessors.

2.0 Planning Policy

National Policy

2.1 The UK Government published its sustainable development strategy in 1999 entitled “A better quality of life: A strategy for sustainable development in the UK”. This sets out four main objectives for sustainable development in the UK:

- Social progress that recognises the needs of everyone.
- Effective protection of the environment.
- Prudent use of natural resources.
- Maintenance of high stable levels of economic growth and employment.

2.2 The Sustainable Communities: Building for the future, known colloquially as the Communities Plan was published in 2003. The Plan sets out a long-term programme of action for delivering sustainable communities in both urban and rural areas. It aims to tackle housing supply issues in the South East, low demand in other parts of the country, and the quality of our public spaces. The Communities Plan describes sustainable communities as: active, inclusive and safe, well run, environmentally sensitive, well designed and built, well connected, thriving, well served and fair for everyone.

2.3 The most relevant national planning policy guidance on sustainability is set out in:

- National Planning Policy Framework - 2012

2.4 In addition the Government’s energy policy, including its policy on renewable energy is set out in the Energy White Paper with a target to generate 10% of UK electricity from renewable energy sources by 2010 together with a cut in carbon dioxide emissions by some 60% by 2050.

2.5 Introduced in 2006, the aim of the Code for Sustainable Homes is to provide a single national standard to guide industry in sustainable design and construction. It sets out principles to be considered within the design of dwellings, and sets minimum levels of compliance that must be achieved to qualify for each of the six code levels.

Regional and Local Policies

The South East Plan

- 2.6 The South East Plan (SEP), which comprises the Regional Spatial Strategy for the South East of England was published in May 2009. The Spatial Strategy is based on six spatial planning principles:
- A co-ordinated approach to managing change within key settlements.
 - Focusing development on regional hubs
 - Pursuing an urban focus and urban renaissance. Policy SP3 seeks among other things to achieve at least 60% of new development on previously developed land and through conversions of existing buildings
 - Spreading opportunities more evenly around the region through co-ordination of regeneration and social inclusion
 - Respecting the pattern of settlements and undeveloped areas
 - Supporting the vitality and character of rural areas whilst protecting valuable natural and historic assets
- 2.7 The cross-cutting policies of the SEP aim to ensure sustainable development, which minimises impact on and is adaptive to climate change. It also seeks under Policy CC6 to ensure the promotion and creation of sustainable and distinctive communities through the use of innovative design processes to create a sense of place and ease of access, social inclusion and environmentally sensitive development.
- 2.8 Policy NRM11 of the South East Plan requires developments or more than 10 dwellings or 1,000sqm non-residential floorspace to secure at least 10% of their energy requirements from decentralised, renewable or low-carbon energy sources

Local Policies

- 2.9 The Havant Borough Core Strategy is the principal document in the Council's LDF. The Local Plan is dated and a number of policies have been 'Saved'. There are no specific policies addressing 'sustainability' and this Statement has sought to comply with the policies contained within the Core Strategy.

Havant Borough Council – Core Strategy adopted 1st March 2011

- 2.10 The most relevant policies are these are summarised for the purposes of this Statement:

Policy CS14 Efficient Use of Resources

- 2.11 Planning permission will be granted for development that:
2. Locally contributes to the delivery of the PUSH target of 100MW of renewable energy by 2020 for the whole of the PUSH area. Major areas of development must ensure that their on-site renewable energy production is maximised and resource efficiency is maximised.
 3. On completion, unless proven to be financially or technically unviable, meets the following standards:

Residential development – Level 3 of the Code for Sustainable Homes;
Particular attention should be paid to water efficiency measures.
 4. Allowable Solutions' may be used to achieve higher levels of carbon reduction where on-site proposals are not feasible or viable.

Policy CS16 High Quality Design

- 2.12 Planning permission will be granted for development that is designed to a high standard, which helps to create places where people want to live, work and relax. All development should demonstrate that its design:
1. Responds to, draws inspiration from and respects local context and:
 - a) Identifies and responds positively to existing features of natural, historic or local character within or close to the proposed development site;
 - b) Integrates with existing local landscape features, promotes wildlife and biodiversity and/or applies characteristics of the local area into the design of a scheme wherever

- possible to create variety and interest;
- c) Uses the characteristics of the locality to help inform the design of the new development including heights, massing, existing buildings lines, plot widths and depths, materials and proportions of windows and doors;
 - d) Is well connected to and integrates with the immediate local area and the wider area by linking to existing pedestrian and cycle routes and encouraging people to use public transport where possible; and
 - e) The development does not cause unacceptable harm to the amenity of neighbours through smell, the loss of privacy, outlook, noise and overlooking.
2. Produces a positive relationship between buildings, street and spaces both existing and proposed, where:
 - a) The layout of the development reduces opportunities for crime and antisocial behaviour; contributes to improving community safety; and makes provision for the management and maintenance of the development;
 - b) New streets are not dominated by vehicular traffic;
 - c) The layout of the development is legible, meaning it is easy to orientate oneself and move through.
 3. Contributes to the improvement of the public realm close to the development, particularly sites close to town, district and local centres and other priority regeneration areas by using high quality hard and soft landscape material and street furniture; and where development is of a significant scale or prominence makes provision for public art.
 4. Is inclusive by considering the needs of those with disabilities, ensuring safe and convenient access for all; and integrating affordable and supported housing with market housing through tenure blind design to minimise social exclusion and promote social integration.
 5. Maximises opportunities for mixed use developments, particularly in town and district centres; and encourage higher densities (50+ dwellings per hectare) where appropriate.
 6. Mitigates negative environmental impacts through sustainable design and construction methods, resource efficiencies, particularly water and the provision of facilities for waste recycling.
 7. Adapts to the changing needs of the users and the changing climate over the lifespan of the building.

3.0 Assessment Methodology

3.1 In assessing this proposal we have been informed by the following guidance:

- SEEDA Sustainability Checklist
- Code for Sustainable Homes.
- BRE Green Guide to Specification.
- Considerate Constructors Scheme

3.2 The baseline energy demand for the proposal has been established by preparing SAP calculations for the apartment.

3.3 These calculations have been based upon certain assumptions as to the building specification and these are clarified below. These are not design calculations but serve to establish the environmental, technical and economic viability of various renewable and low carbon technologies.

Emission Factors

3.4 The CO₂ emission factors, where applicable, used throughout this report have been taken from the Building Regulation Approved Document L.

Fuel	Kg CO ₂ /kWh
Natural Gas	0.198
Grid supplied electricity	0.517
Displaced electricity	0.529

4.0 Proposal

4.1 The proposal is for the construction of 26 apartments arranged in a single block.

The accommodation schedule in detail is as follows;

Unit Type	No.	Area	Totals
1-Bedroom apartment	1	49	49
1-Bedroom apartment	3	50	150
1-Bedroom apartment	4	51	204
1-Bedroom apartment	1	52	52
1-Bedroom apartment	1	53	53
1-Bedroom apartment	1	54	54
1-Bedroom apartment	3	55	165
1-Bedroom apartment	1	56	56
1-Bedroom apartment	1	57	57
2-Bedroom apartment	2	60	120
2-Bedroom apartment	3	62	186
2-Bedroom apartment	2	66	132
2-Bedroom apartment	1	67	67
2-Bedroom apartment	2	68	136
Total	26		1,481

5.0 Demand Reduction (Be Lean and Be Clean)

Design

- 5.1 The energy performance of a building is affected by the building design, its construction and its use. Whilst occupant behaviour is beyond the remit of this statement, better design and construction methods can significantly reduce the life cycle emissions of a building and assist the occupant to reduce consumption.
- 5.2 Sustainable design is not just about incorporating renewable technologies, buildings should be designed at the outset to provide suitable environmental conditions for the occupants whilst also consuming as little energy as practical. It is possible to exceed Building Regulations requirements (Part L 2010) through demand reduction measures alone, which typically include a combination of passive design measures (e.g. building design and efficient building fabric) and active design measures (e.g. variable speed motors)

Passive Design Measures

- 5.3 The passive design measures proposed include;

Passive Solar Gain

- 5.4 The architectural and structural features of a building will affect energy consumption and the use of natural daylight; orientation, thermal mass, shading and mitigation of wind exposure will reduce heating, cooling and lighting requirements.
- 5.5 The building has been designed in the context of the existing street-scape and prominence of the corner site. However, the building has been orientated to maximise the number of units with outlooks from due west through to due east.

Natural Ventilation

- 5.6 All the apartments will have operable windows to allow for natural ventilation. Mechanical extract ventilation will be provided to appropriate rooms.

Natural Daylighting

- 5.7 The orientation and the size of the windows have been optimised to maximise the amount of natural daylight and therefore reduce the demand for artificial lighting.

Efficient Building Fabric

Building Envelope

- 5.8 U-values of the dwelling envelope must meet Building Regulations Part L1A standards; further improvements to U-values will reduce the development heating requirements, favourably impacting in reduce energy demand.
- 5.9 The selection of high thermal density materials can help to stabilise temperature fluctuations in a building, reducing maximum demands on building services.
- 5.10 It is likely the construction will utilise traditional materials with highly insulated cavity wall construction. The U-values will exceed those required by the Building Regulations.
- 5.11 It is proposed to set maximum limits for the elemental U-values as follows;

Element	Proposed W/m ² K
External Walls	0.25
Roof	0.12
Floor	0.15
Windows	1.40

- 5.12 The increased thermal mass provided by traditional construction will assist in stabilising summer night-time.

Air Leakage

- 5.13 Large amounts of heat are lost in winter through air leakage from a building (also referred to as infiltration of air permeability) often through poor sealing of joints and openings in the building
- 5.14 ADL sets a minimum standard for air permeability of 10 m^3 of air per hour per m^2 of envelope area, at 50Pa. Air tightness standards for the homes will be constructed to the 'Accredited Construction Details' as compiled by Department of Communities and Local Government (DCLG). These will average a 50% improvement over Building Regulations and will achieve a permeability of less than $5 \text{ m}^3/\text{hr}/\text{m}^2$.
- 5.15 In addition thermal detailing will be improved to reduce the 'psi' value.

Active Design Measures

- 5.16 The active design measures proposed include;

Efficient Lighting and Controls

- 5.17 Throughout the scheme natural lighting will be optimised.
- 5.18 Approved Document L1A requires three in four light fittings (75%) to be dedicated low energy fittings. The development will exceed this and all light fittings will be of a dedicated energy efficient type.
- 5.19 External lighting will be fitted with time controls and light sensors to ensure illumination is restricted to required times. External lighting will be limited to a maximum fitting output of 150w. Daylight and PIR sensors will also be used in some communal areas and automatic dimming lights used in conjunction with the sensors.

6. Climate change adaption and Water resources

Sustainable Drainage Systems (SUDS)

- 6.1 The development will discharge less surface water off-site than the previous use of the site. This will be achieved by using sustainable urban drainage system.
- 6.2 An integrated approach to SUDS will be adopted that mimics natural drainage, retains water at the surface wherever possible and seeks to maximize biodiversity.

Water efficiency measures

- 6.3 The water efficiency measures included in this development will ensure that the water use target of 105 litres per person per day is achieved using the measures described below.

Low-flow fittings

- 6.4 Low-flow fittings have a significant impact on the annual water demand. The equipment, which will have low-flow fittings includes:

- Water taps
- Showers

Dual flush toilets

- 6.5 In order to reduce the water consumption of toilets, dual flush toilets will be installed to reduce water consumption. The building user guide will have a section to raise awareness for the appropriate use of dual flush toilets.

7.0 Establishing Energy Demand and Carbon Dioxide Emissions

7.1 The quantum of accommodation is set out in 4.0 above.

SAP Calculations – residential

7.2 Detailed working drawing design has not been carried out but the SAP calculations have been prepared based upon the detailed planning drawings and an assumed specification. The SAP calculation has been modelled on a 56 m², 1-bedroom apartment (Apartment 7), which is the average size of units at the development and is proposed as representative of the site. The unit has been modelled as a ground and mid floor unit (the mid floor unit is hypothetical and is for modelling purposes only). The top floor apartments are assumed to have the same energy demand and CO₂ emissions as the ground floor units. The results from these calculations have been aggregated across all units in the relevant locations to arrive at the total energy demand and CO₂ emissions.

7.3 A SBEM calculation compiled for a similar Home has been used to determine the energy demand and CO₂ emissions of the communal areas. This is predicated as 109.89 kWh/m²/yr with associated emissions of 25.12 kg/m²/yr.

7.4 The results from the SAP calculation are summarised as follows:

1 Bed apartment 56 sq m Ground Floor	Energy DER kWh/m ² /yr	CO ₂ DER kg CO ₂ /m ² /yr
Space Heating	32.30	6.40
Water heating	35.53	7.03
Electricity for lighting, pumps and fans	6.56	3.39
Total SAP	74.39	16.82

1 Bed apartment 56 sq m Mid Floor	Energy DER kWh/m ² /yr	CO ₂ DER kg CO ₂ /m ² /yr
Space Heating	28.67	5.68
Water heating	35.53	7.03
Electricity for lighting, pumps and fans	6.56	3.39
Total SAP	70.76	16.10

7.5 Therefore the total energy demand and CO₂ emissions from the site is;

Unit	Area m ²	Energy DER kWh/yr	CO ₂ DER kg/yr
Ground Floor Apartments	435	32,360	7,317
Mid Floor Apartments	594	42,031	9,563
Top Floor Apartments	452	33,624	7,603
Communal Areas (Lounge, Guest Suite and Laundry)	102	11,209	2,562
		119,224	27,045

7.6 The total site energy demand is assessed as:

- **119,224 kWh/year**

With associated CO₂ emissions of:

- **27,045 kg/year**

8.0 Renewable Technologies

8.1 The energy demand established above has been used to test the viability of various renewable and low carbon technologies as follows.

8.2 This section determines the appropriateness of each renewable technology and considers the ability of each technology to comply with the planning requirements as set out above in Section 2.0.

8.3 The Government's Renewable Obligation defines renewable energy in the UK. The identified technologies are;

- Small hydro-electric
- Landfill and sewage gas
- Onshore and offshore wind
- Biomass
- Tidal and wave power
- Geothermal power
- Solar

8.4 The use of landfill or sewage gas, offshore wind or any form of hydroelectric power is not suitable for the site due to its location. The remaining technologies are considered below;

Wind

8.5 Wind turbines are available in various sizes from large rotors able to supply whole communities to small roof or wall-mounted units for individual dwellings.

8.6 The Government wind speed database predicts local wind speeds at London Road to be 5.0 m/s at 10m above ground level and 5.8 m/s at 25m above ground level. This is below the level generally required for commercial investment in large wind turbines and in addition the land take, potential for noise and signal interference make a large wind turbine unsuitable for this site.

- 8.7 Roof mounted turbines could be used at the development to generate small but valuable amounts of renewable electricity but the small output and contribution to total emissions means and investment would be small and purely tokenism.

Combined Heat and Power and Community Heating

- 8.8 Combined heat and power (CHP) also called co-generation is a de-centralised method of producing electricity from a fuel and 'capturing' the heat generated for use in buildings. The plant is essentially a small-scale electrical power station. The production and transportation of electricity via the National Grid is very inefficient with over 65% of the energy produced at the power station being lost to the atmosphere and through transportation.
- 8.9 Consequently CHP can demonstrate significant CO₂ savings and although not necessarily classed as renewable energy (depending on the fuel used) the technology is low carbon.
- 8.10 For a CHP plant to be economic it needs to operate for as much of the time as possible (usually deemed to be in excess of 14 hours per day) and therefore the size of the unit are usually based upon the hot water load of the buildings with additional boilers meeting the peak space heating demand.
- 8.11 Community heating schemes are similarly communal systems but seek to supply heat only without the electricity production. Therefore, unless using a biomass or biofuel a community heating system will not demonstrate CO₂ reductions
- 8.12 In order to optimise a combined heat and power or communal heating system, whether fuelled by biomass or a fossil fuel the site needs to be relatively dense with buildings close together and preferable multi storey in order to minimise infrastructure pipe work.
- 8.13 A communal heating or CHP system would be appropriate but issues with maintenance, servicing and management costs means it is not proposed.
- 8.14 Community heating and combined heat and power systems are not proposed.

Ground Source Heat Pumps

- 8.15 Sub soil temperatures are reasonable constant and predictable in the UK, providing a store of the sun's energy throughout the year. Ground source heat pumps (GSHP) extract this low-grade heat and convert it to usable heat for space heating.
- 8.16 GSHP operates on a similar principle to refrigerators, transferring heat from a cool place to a warmer place. They operate most efficiently when providing space heating at a low temperature, typically via under floor heating or with low temperature radiators.
- 8.17 There are generally two types of installation being a bore-hole (open loop) and a closed loop system.
- 8.18 Open loop bore holes extract energy from ground water located deep below the surface and discharge the water back to the ground reservoir whereas closed loop systems circulate a fluid around a series of boreholes or horizontal 'slinky' and extract heat from the ground.
- 8.19 Ground source heat pumps could be used subject to satisfactory ground investigation to establish whether the sub-strata is appropriate. There is insufficient ground area to accommodate a 'slinky' system and a borehole system would be required.
- 8.20 Ground source heat pumps could theoretically be used but there is insufficient ground area to accommodate a horizontal system and a bore-hole system would be necessary.
- 8.21 Prohibitive costs of providing bore-holes mean this technology is not proposed.

Solar

(i) Solar Water Heating

- 8.22 Solar hot water panels use the sun's energy to directly heat water circulating through panels or pipes. The technology is simple and easily understood by purchasers.

- 8.23 Solar hot water heating panels are based generally around two types, which are available being 'flat plate collectors' and 'evacuated tubes'. Flat plate collectors can achieve an output of up to 1,124 kWh/year* and evacuated tubes can achieve outputs up to 1,365 kWh/year **

* Figures taken for Schuco Compact K

** Figures taken from Riomay

- 8.24 Panels are traditionally roof mounted and for highest efficiencies should be mounted plus or minus 30 degrees of due south.

- 8.25 There are ten top floor apartments (eight to the second and two to the first floor). Whilst it can be problematic servicing lower floors the design allows panels to be located on the flat roof above Plots 12 & 13 to serve Plots 11 & 14.

- 8.26 Solar thermal panels could be used.

ii) **Photovoltaics**

- 8.27 Photovoltaic panels (PV) provide clean silent electricity. They generate electricity during most daylight conditions although they are most efficient when exposed to direct sunlight or are orientated to face plus or minus 30 degrees of due south.

- 8.28 PV panels can be integrated into many different aspects of a development including roofs, walls, shading devices or architectural panels. The panels typically have an electrical warranty of 20-25 years and an expected system lifespan of 25-40 years.

- 8.29 The expectation is that there will be a reduction in the capital costs in the near future but currently the capital cost per unit of energy output is significantly higher than solar water heating panels and the efficiency of energy conversion lower.

- 8.30 However, as a result of the higher CO₂ emissions factors for electricity versus gas PV can be effective where planning policies seek reduction in CO₂ emissions rather than production of renewable **energy**.

- 8.31 Assuming the use of 245W PV panels, to achieve the 10% contribution to energy demand a total in excess of 60 panels will be required. There is insufficient roof area to accommodate this quantum and a solution using PV alone is not proposed.

Air Source Heat Pumps (ASHP)

- 8.32 Air sourced heat pumps operate using the same reverse refrigeration cycle as ground source heat pumps, however the initial heat energy is extracted from the external air rather than the ground. These heat pumps can be reversed to provide cooling to an area although this reduces the coefficient of performance of the pumps.
- 8.33 One of the main manufacturers, Daikin has recently introduced a communal air source system which reduces the number of individual outside units required and this could be used in lieu of separate outside units.
- 8.34 Either system (communal or individual) could be used with the outside units located within the grounds of the building.

9.0 Proposal for Renewable and/or Low Carbon Technologies

- 9.1 The total site energy demand is predicted to be **119,224 kWh per year** with associated CO₂ emissions of **27,045 kg per year**
- 9.2 It is proposed to provide solar hot water heating panels to the eight units, which comprise the top and four units on the first floor.

Solar Hot Water Heating

- 9.3 It is proposed to install a single Riomay solar hot water heating panel, which will provide up to 50% of the total annual hot water demand of each apartment.
- 9.4 The panels are evacuated and can be laid flat on the flat roof. They will therefore not be visible from ground level.
- 9.5 The solar panels will be provided in addition to the gas boiler to provide a proportion of renewable energy. The solar collector is connected to the secondary coil on the hot water cylinder and water is circulated around this system using a pump. The power consumption of the pump has been taken into account in the figures quoted which are net figures. The hot water system is pressurised and a dual coil hot water cylinder used.

9.6 It is therefore proposed to install the following;

Plot Number	Hot Water Demand kWh/year	50% of Hot Water Demand kWh /year	Number Of Panels	Contribution From Panels
Plot 11	2,203	1,102	1	1,102
Plot 12	2,132	1,066	1	1,066
Plot 13	2,416	1,208	1	1,208
Plot 14	2,203	1,102	1	1,102
Plot 19	2,345	1,173	1	1,173
Plot 20	2,381	1,191	1	1,191
Plot 21	1,812	906	1	906
Plot 22	1,812	906	1	906
Plot 23	1,777	889	1	889
Plot 24	2,025	1,013	1	1,013
Plot 25	1,954	977	1	977
Plot 26	1,954	977	1	977
12,510			12	12,510

9.7 It is proposed to install a single evacuated tube solar hot water heating panel into each unit, which will reduce the total energy demand by **12,510 kWh per year**.

9.8 This equates to a contribution of **10.49%** of total demand from the installation of renewable technologies.

APPENDIX 1

**Code for Sustainable Homes
Pre Assessment Estimator**

Code for Sustainable Homes : Pre Assessment Estimator

Total Predicted Score ; **59.01**

Predicted Level ; **Level 3**

36 Points Level 1*
48 Points Level 2**
57 Points Level 3***
68 Points Level 4****
84 Points Level 5*****
90 Points Level 6*****

Site Address; **London Road/ Hulbert Road, Waterlooille**

Code Category	Description	Credits	%	Assumptions	Criteria	Information to be provided
Ene 1	Dwelling Emission Rate	0 of 10	0.00	The development will incorporate enhanced energy efficient measures and low carbon and renewable technologies.	Credits are awarded based on the percentage improvement of the DER over the TER as calculated using SAP 2009. Minimum standards for each Code level apply. Building Regs = 0 credits, 25% improvement (Code 4) = 3 credits	SAP 2009 Worksheet, dated with the energy assessors name, registration number
Ene 2	Fabric Energy Efficiency	4 of 9	4.70	Fabric enhancements incorporated within the development are likely to achieve an FEE of less than 45 kWh/m2/year.	Credits are awarded based on the Fabric Energy Efficiency (kWh/m2/yr) of the dwelling. Minimum standards apply at Code levels 5 and 6.	SAP 2009 Worksheet, dated with the energy assessors name, registration number
Ene 3	Energy Display Devices	2 of 2	2.35	Energy display devices will be installed.	Credits are awarded where a correctly specified Energy Display Device is installed monitoring electricity and/or primary heating fuel consumption. Primary or electricity only = 1 credit, Electricity and primary = 2 credits	
Ene 4	Drying space	1 of 1	1.17	Tidy dryers will be provided with at least 30m of line.	Credit awarded for the provision of either internal or external secure drying space with posts and footings or fixings capable of holding 4m+ of drying line for 1-2 bed dwellings and 6m+ for dwellings of 3 beds or greater.	Drawing need to show the location of fixings/footings or posts and confirmation of the minimum length of line
Ene 5	Energy Labelled White Goods	2 of 2	2.35	White goods supplied.	Credits are awarded where each dwelling is provided with either information from the EU labelling Scheme, White Goods with ratings from A+ to B or a combination. 1 credit for labelling and 2 where white goods provided.	Specification to be provided
Ene 6	External lighting	2 of 2	2.35	Low energy external light fittings are provided	Credits are awarded based on the provision of space lighting with dedicated energy efficient fittings and security lighting fittings.	Drawings need to show the location and type of all external light fittings
Ene 7	Low or zero carbon technologies	0 of 2	0.00	Assumed no credits.	Credits are awarded where there is a 10% or 15% reduction in CO2 emissions resulting from the use of low or zero carbon technologies. 10% = 1 credit, 15% = 2 credits	SAP 2009 Worksheet, dated with the energy assessors name, registration number
Ene 8	Cycle storage	0 of 2	0.00	Assumed no credits.	Credits are awarded where there is adequate, safe, secure and weather proof cycle storage is provided.	Drawings need to show the location, type and storage including access and security measures
Ene 9	Home office	1 of 1	1.17	Space available in living room. Facilities provided will include two double sockets, one telephone point (broadband enabled), a wall of at least 1.8m in length and adequate ventilation.	A credit is awarded for the provision of a home office. The location, space and services provided must meet the Code requirements	Drawings or specification text needs to detail the location of and sufficient space for the home office including the location of sockets, telephone points, adequate ventilation and confirmation that cable connection or that broadband is available at the address
Wat 1	Indoor water use	3 of 5	4.50	Mandatory requirement to achieve 3 credits for Code 3 and 4. The Strategy will include dual flush WCs, kitchen tap flows of 4 l/min, wash hand basin flows of 3 l/min, and shower flows of 9 l/min. Bath capacities will be less than 150 litres.	Credits are awarded based on the predicted average household water consumption, calculated using the Code Water Calculator Tool. Min standards for each Code level apply.	Need to specify WCs with 4l/2.6l flush, basin taps at max flow rate of 1.7 l/min, showers at 8 l/min, bath at 160 litres, sink at 4 l/min. These are approximate and for example if it is proposed to exceed the volumes and flow rates it may be necessary to install greywater or rainwater harvesting systems
Wat 2	External water use	1 of 1	1.50	Water butts will be provided.	A credit is awarded where a compliant system is specified for collecting rainwater for external irrigation purposes. Where no outdoor space is provided the credit can be awarded by default.	Drawings and specification detailing the location, details and type of any rainwater collection system. Needs to exceed 200 litres in capacity.
Mat 1	Environmental impact of materials	12 of 15	3.60	The score can only be verified at detailed design stage with reference to the Green Guide to Housing Specification. It is anticipated that at least an A rating will be achieved for windows, floors, external and internal walls and roofs.	At least 3 of 5 key building elements (roof, ext. walls, int. walls, upper and ground floors, windows) must achieve a Green Guide 2008 rating of A+ to D. Points are awarded on a scale based on the Green Guide Rating of the specifications.	Materials specification to be provided including external materials schedule.
Mat 2	Responsible sourcing of materials - basic	4 of 6	1.20	The score can only be verified at detailed design stage. Assumed 4 credits will be achieved from a maximum of 6.	Credits are awarded where materials used in the basic building elements are responsibly sourced.	Materials quantities and spec required
Mat 3	Responsible sourcing of materials - finishing	2 of 3	0.60	The score can only be verified at detailed design stage. Assumed 2 credits will be achieved from a maximum of 3.	Credits are awarded where materials used in the finishing elements are responsibly sourced.	Materials quantities and spec required

Sur 1	Surface water run-off	2 of 2	1.10	This is a mandatory element of the Code. All surface water run-off rates post construction will be less than the existing conditions. It is anticipated SuDs will be incorporated into the surface water disposal design.	Peak rate of run-off into watercourses is no greater for the developed site than it was for the pre-development site and that the additional predicted volume of rainwater discharge caused by the new development is entirely reduced as far as possible in accordance with the assessment criteria. Tradeable. Where SuDs are used to improve water quality of the rainwater.	Confirmation of method of surface water disposal. Drawings and specification required. Need to show the location and capacity of soakaways or the surface water sewer with a calculation that the discharge volume is less than the previous use.
Sur 2	Flood risk	2 of 2	1.10	An Environmental Agency map suggests the site has a low risk of flooding for fluvial and tidal sources. At the detailed design stage an FRA will be prepared to assess the risk of flooding from all potential sources.	Credits are awarded where developments are located in areas of low flood risk or where in areas of medium or high flood risk appropriate measures are taken to prevent damage to the property and contents.	Need confirmation that site is not in Flood Zone. We should be able to obtain this from Flood Maps
Was 1	Storage of recyclables and waste	4 of 4	3.20		The space provided for waste storage should be sized to hold the larger of either all external containers provided by the LA or the min capacity calculated from BS 5906. Tradeable credits are awarded for adequate internal and/or external recycling facilities.	Kitchen layout needs to include recycling 'unit' of at least 30 litres. Drawings and specification describing the location and size of storage, access to storage and that an information booklet will be supplied.
Was 2	Construction Site waste	2 of 3	1.60	A Site Waste Management Plan will be provided to include procedures and commitments to divert waste from landfill. This will be for a minimum of 3 waste groups and will be reviewed throughout the construction process. It is assumed the 3rd credit available for diverting at least 85% of non-hazardous waste from landfill will NOT be achieved.	A credit is awarded where a compliant SWMP is provided with targets and procedures to minimise construction waste. Credits available where the SWMP include procedures and commitments for diverting either 50% or 85% of waste generated from landfill.	Site Waste Management Plan needed.
Was 3	Composting	0 of 1	0.00	No composting facilities will be supplied.	A credit is awarded where individual home composting facilities are provided, or where a community/ communal composting service either run by the LA or overseen by a management plan is in operation.	Drawings need to show location and specification of composter to be supplied.
Pol 1	Global warming potential of insulants	1 of 1	0.70	All insulation materials specified will have a zero Ozone Depleting Potential and Global Warming Potential of less than 5.	A credit is awarded where all insulating materials only use substances that have a GWP of less than 5.	Provide all technical details of insulation materials to be used. Proposed insulation materials for each element and drawings and specification showing the type and location and where specified, manufacturers/ installers literature for any foamed insulation materials installed using blowing agents
Pol 2	Nox emissions	3 of 3	2.10	Gas boilers with Nox emissions less than 40 mg/kWh.	Credits are awarded on the basis of Nox emissions arising from the operation of the space and water heating system within the dwelling.	Specification of the boiler to be fitted including technical details.
Hea 1	Daylighting	1 of 3	1.17	Daylighting calculations would be carried out at the detailed design stage. At this stage it is assumed that sufficient natural daylight is available to allow 1 credits to be achieved. It is assumed the view of the sky credit will not be achieved.	Credits are awarded for ensuring key rooms in the dwelling have high daylight factors (DF) and a view of the sky.	Calculations required of the average daylight factor using the formula provided in the Relevant Definition section as set out in BS 8206-2 or computer simulation
Hea 2	Sound insulation	1 of 4	1.17	Robust details will be used.	Credits are awarded where performance standards exceed those required in the Building Regulations Part E. This can be demonstrated by carrying out pre-completion testing or through the use of Robust Details Limited.	No action required
Hea 3	Private space	1 of 1	1.17	The units have access to private communal space.	A credit is awarded for the provision of an outdoor space that is at least partially private. The space must allow easy access to all occupants.	No action required
Hea 4	Lifetime Homes	4 of 4	4.67	Lifetime Homes standards will be achieved.	Credits are available where all principles of the Lifetime Homes scheme are implemented.	A completed Lifetime Homes Checklist Hea 4 indicating compliance with all applicable points 1-16 and as-built drawings showing each feature from completed Checklist
Man 1	Home User Guide	3 of 3	3.33	A Home User Guide will be prepared and supplied to to all dwellings. Information will be provided on the environmental performance of the home, information regarding the site and its surroundings, and will be made available in other formats.	Credits are awarded where a simple guide is provided to each dwellings covering information relevant to the 'non-technical' home occupier, in accordance with the Code requirements.	A Home User Guide needs to be prepared covering operational issues will be supplied confirmation in the specification that the guide will be supplied to the home and be developed to the required standards and as a minimum will cover the following: environmental strategy, design and features, energy, water use, recycling and waste, sustainable DIY, emergency information, links/references and further information
Man 2	Considerate Constructors	1 of 2	1.11	The Considerate Constructors scheme will be used and there is a commitment to achieve Best Practice standards.	Credits are awarded where there is a commitment to comply with best practice site management principles using either the Considerate Constructors Scheme or an alternative locally/ nationally recognised scheme.	
Man 3	Construction site impacts	2 of 2	2.22	Air pollution controls will be put in place including dust sheets, covering of skips, damping down etc. Best practice policies in respect of water pollution. Water use from site activities will be monitored.	Credits are awarded where there is a commitment and strategy to operate site management procedures on site.	
Man 4	Security	2 of 2	2.22	The Architectural Liaison Officer will be consulted. Secured by Design standards will be sought.	Credits are awarded for complying with Section 2 - Physical Security from Secured by Design - New Homes. An Architectural Liaison officer (ALO), or alternative, needs to be appointed early in the design process and their recommendations incorporated.	Specification clause or other confirmation of commitment showing that an ALO/CPDA has been or will be appointed to provide advice early in the design stage to ensure the requirements of Section 2 - Physical Security of Secured by Design - New Homes are met and that the advice of the ALO/CPDA will be followed.

Eco 1	Ecological value of site	1 of 1	1.33	The site is assumed to be of low ecological value.	A credit is awarded for developing land of inherently low value.	Plans of the site and surrounding area prior to development, identifying any features, both built and ecological
Eco 2	Ecological enhancement	0 of 1	0.00	No credits.	A credit is awarded where there is a commitment to enhance the ecological value of the development site.	
Eco 3	Protection of ecological features	1 of 1	1.33	Credit awarded by default because of the Eco 1 credit.	A credit is awarded where there is a commitment to maintain and adequately protect features of ecological value.	Topographical survey to be provided with trees to be removed shown. Trees to be confirmed for species and grade.
Eco 4	Change of ecological value	2 of 4	2.67	Assumed neutral effect of development on ecology because of the residential nature of the proposals. Possible upside.	Credits are awarded where the change in ecological value has been calculated in accordance with the Code requirements and is calculated to be: Major negative change (-9) = 0 credits, Minor negative change (-9 and -3) = 1 credits, Neutral (-3 and +3) = 2 credits, Minor enhancement (+3 and +9) = 3 credits, Major enhancement (greater than 9) = 4 credits	Landscaping plan to be provided. We will try and work out whether there is any enhancement over the previous situation
Eco 5	Building footprint	1 of 2	1.33	Apartments are three storey.	Credits are awarded where the ratio of combined floor area of all dwellings on the site to their footprint is: Houses 2.5:1 or Flats 3:1 = 1 credit, Houses 3:1 or Flats 4:1 = 2 credits	

59.01

APPENDIX 2

RENEWABLE DATA SHEETS



Like all solar thermal systems, the Ecotube uses solar energy to heat water. Unlike others, its energy efficiency is far in advance of the 528kWh per square metre per year quoted as the industry 'standard'. In fact the Ecotube achieves over 850kWh per square metre per year.

...revolutionising carbon reduction

The Ecotube is an advanced form of evacuated tube solar collector which is designed to maximize the solar energy absorbed and minimise heat loss through radiation. Developed and patented by Riomay, the revolutionary Ecotube has substantially reduced the amount of 'parasitic' energy lost by most evacuated tube systems (energy used up by the system itself during the process of converting solar energy to heat).

As a result, the Ecotube system requires smaller pumps to circulate the fluid in the evacuated tube collector which means that there are fewer drops in pressure through the system, giving a more sustained level of heat than almost any other system.

In fact, independent laboratory tests prove that the Ecotube produces over 750kWh per square metre per year in direct heating mode and a staggering 850kWh per square metre per year in pre-heat mode. (See technical note on page 9.)

For architects The Ecotube's flexibility is outstanding: it can be installed flat on a roof, at an angle or horizontally on flank walls. Thanks to the creative approach of the Riomay team, the panels have been used as attractive architectural features on homes, schools, leisure buildings and pergolas.

For facilities managers Riomay systems reduce the cost of heating water for changing rooms, laundries, kitchens, swimming pools, baths and showers. Converting to renewable energy is not just a matter of environmental responsibility – it is sound financial management.

For developers Government legislation means that installing renewable energy systems is a must. Be confident that you are giving your customers the best with Riomay, the company responsible for some of the biggest, most prestigious and best-performing solar thermal installations in the UK.



For home owners Of all the commercially available renewable energy systems, solar thermal is the easiest and least contentious to install. Unlike wind turbines solar heating is silent, visually unobtrusive, will not damage buildings, and can be installed effectively almost anywhere. Riomay has a reputation for reliability – don't risk the alternatives.

how the ecotube works

There are two main types of solar panel. Some convert sunlight into electricity, others convert it into heat. The Ecotube absorbs solar radiation, and uses that energy to raise the initial temperature of a hot water system.

Simple solar panels designed for this purpose have been around for many years. The most basic are glazed flat plate collectors, which resemble domestic radiators, and are made from black-coated metals or black plastics such as polypropylene.

The disadvantage of a basic flat plate collector is that it also radiates heat. So as the fluid within it gets warmer, it can lose up to 90 per cent of that energy to the air. The hotter it gets, the worse the problem, so the efficiency of the system falls off rapidly. Performance can be improved by using a selective coating, which does not radiate so much heat as an ordinary coating like black paint. But heat is still lost by convection and conduction, so the system is relatively inefficient compared to the technology used in the Ecotube.



- On a clear summer day in Europe, the sun's energy at midday is equivalent to a kilowatt per square metre

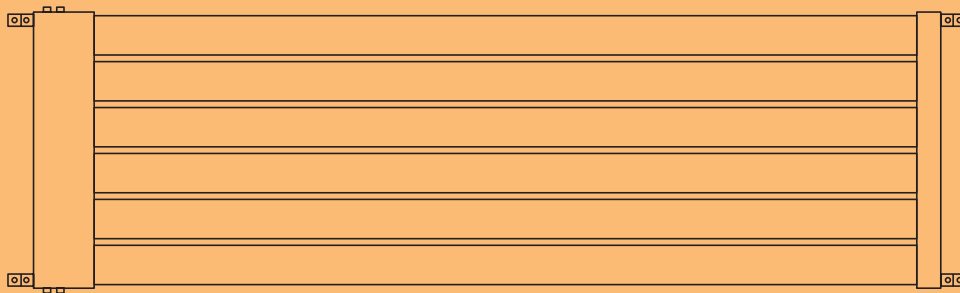
- The Ecotube benefits from a unique concentric pipe direct flow design which allows the panel to be placed in any orientation.



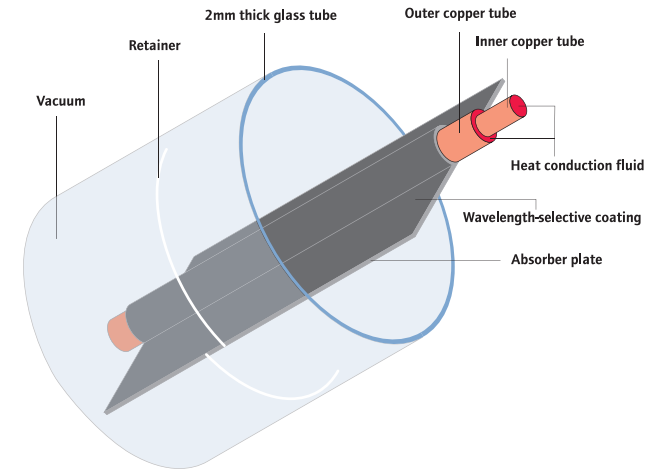
The Ecotube is an advanced form of evacuated tube collector.

The energy absorber is reduced to a strip of aluminium treated with a selective Tinox coating. This absorber strip is bonded to a copper pipe, and fluid is passed through the pipe to collect the heat. The whole assembly is sealed within an evacuated glass tube. The vacuum virtually eliminates heat losses by convection or conduction.

A Riomay panel has an array of six of these tubes, illustrated below.



The Ecotube has been designed to the highest performance specifications. It is the best system of its kind produced anywhere in the world, and will give you many years of reliable service.



Ecotube performance exceeds that of flat plate systems and competing evacuated tube systems. It uses:

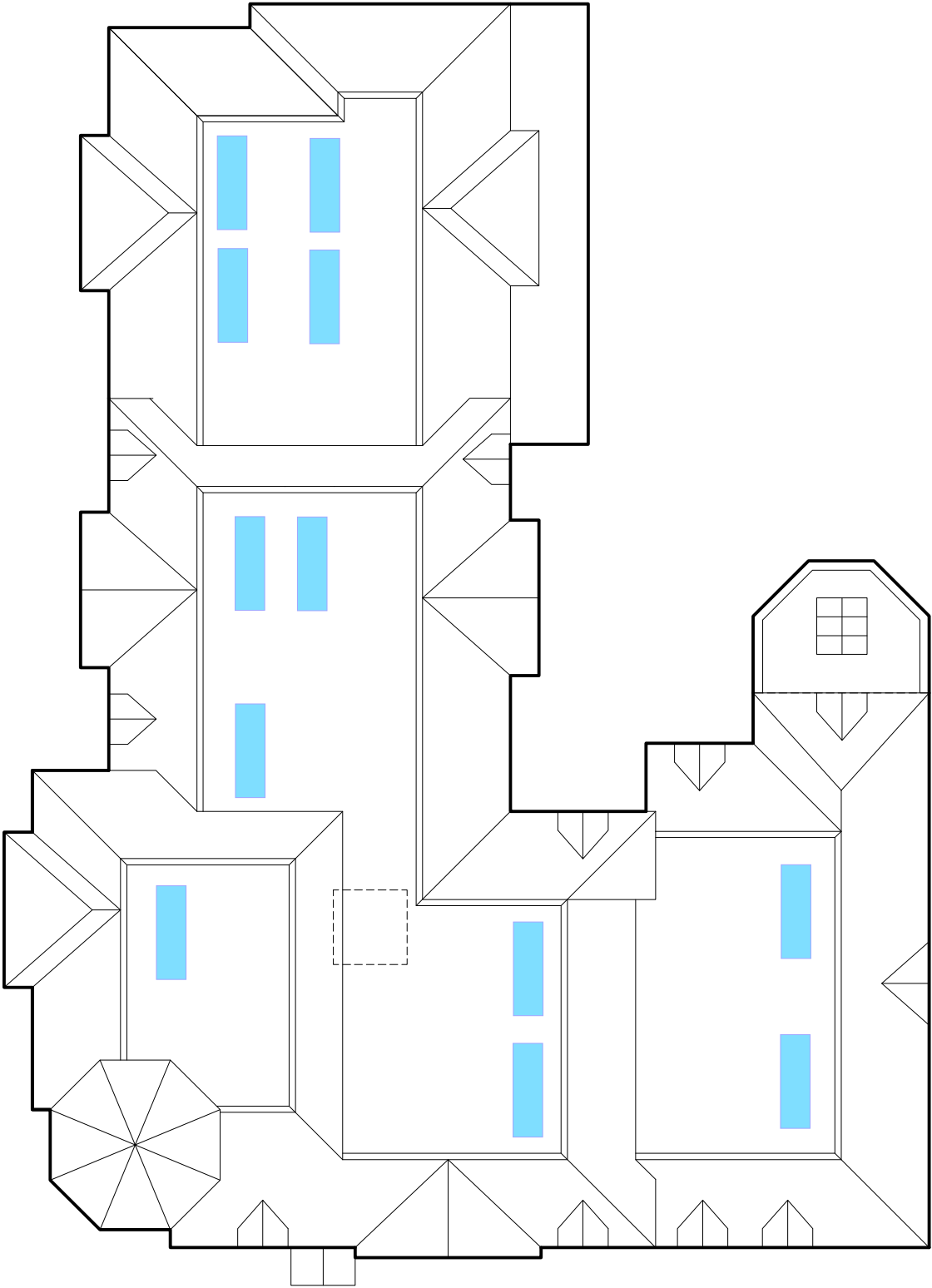
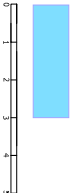
- high transmittance glass, which is virtually transparent to solar energy
- a super-efficient selective coating on the absorber plate, which maximises the solar energy absorbed and minimises the heat energy lost by radiation
- a uniquely durable glass-to-metal seal at the end of each tube, to maintain the high vacuum that prevents energy losses by convection and conduction
- glass and metal components that expand and contract at the same rate in response to temperature changes, resulting in a reliable system, winter or summer

Technical note Preheat mode is when, in a twin-coil cylinder, the lower coil heated by the solar panel achieves tank temperatures of 30–45°C. The top coil, which is heated using a fossil fuel source, then tops up the temperature of the water in the tank to approximately 60°C.

Direct heat mode is when the lower coil heated by the solar panel achieves tank temperatures of about 60°C. This means that the fossil-fuel system is not activated, and all the water in the tank has been heated solely by the sun.

APPENDIX 3

**ROOF PLAN SHOWING POSSIBLE
LOCATION OF SOLAR HOT WATER PANELS**



127A AND 127B, LONDON ROAD,
WATERLOOVILLE PO8 7SH

ROOF PLAN

Scale 1:200 at A3

Drawing No. LRW / P12 / 07