

A large, stylized graphic of a leaf or plant, rendered in shades of red and orange, occupies the left and bottom portions of the page. It features a central stem with several broad, pointed leaves extending outwards.

Sustainability Statement

Port Road, Wenvoe
Redrow Homes (South Wales)

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1	DH	1 st April 2014

1. INTRODUCTION

Further to the outline planning approval for development at the Land to the West of Port Road in Wenvoe, this report has been prepared by Redrow to address the planning conditions relating to application number 2013/00884/OUT.

Vale of Glamorgan Council requires all proposals for new housing developments to be considered in the context of sustainable development and the Council requires a Statement of Sustainability to accompany all planning applications for such development.

Planning Policy asks that the dwellings should achieve Code for Sustainable Homes Level 3 and achieve a minimum of 1 credit under category 'Ene1 - Dwelling Emission Rate' in accordance with the requirements of Code for Sustainable Homes: Technical Guide November 2010.

This report will demonstrate how the required performance ratings could be met, and provide an approach on which the designs can be based.

2. PLANNING POLICY

National Planning Policy

Sustainable development is now firmly embedded in national, regional and local planning policy. These guidelines respond to the Welsh Assembly Government's (WAG) constitutional duty to promote sustainable development and to work with developers, construction clients and funders, the Design commission for Wales and Constructing Excellence to ensure the built environment meets sustainable development goals.

Planning Policy Wales (PPW) sets out the land use planning policies of the Welsh Assembly Government. It is supplemented by a series of Technical Advice Notes (TANs).

The Assembly Government's aim is to secure the strongest economic development policies to underpin growth and prosperity in Wales and recognise in this the importance of clean energy, both as an economic driver and to take forward the Assembly's commitment to sustainable development.

WAG advises that all local planning authorities should facilitate the development of all forms of renewable energy and energy efficiency and conservation measures where they are environmentally and socially acceptable.

Planning Policy Wales indicates that local authorities, through the planning system must provide for homes, infrastructure, investments and jobs in a manner that is consistent with the principles of sustainable development. Similarly, TAN 12 Design (2002) encourages sustainable design solutions that make prudent use of natural resources, incorporating sustainable energy use and waste control measures.

Local Planning Policy

The Council recognises the fundamental role that the UDP can play in contributing to make development in the Vale more sustainable and encourages proposals that bring about environmental or community benefits. Strategic Policy 2 of the UDP aims to ensure that all proposed development within the Vale of Glamorgan respects the need to work towards sustainable development.

The policy recognises that elements of sustainability can be incorporated into developments including energy conservation; assist in management use of natural resources, encourage the use of non-motorised travel modes; avoid pollution; conserve water resources; and conserve/enhance biodiversity.

Vale of Glamorgan Council have produced Sustainable Development Supplementary Planning Guidance to raise awareness of how the development of land can contribute towards sustainability through encouraging a holistic approach to construction and by reducing the impact of a development during its lifetime. The guidance covers a wide range of sustainability issues relating to land-use planning, accessibility, energy efficiency, drainage and water conservation, waste management, landscape and biodiversity.

The guidance states that all proposals for new housing developments will be considered in the context of sustainable development, and the Council requires a Statement of Sustainability to accompany all planning applications for such development. This should outline how a proposal supports the aims of sustainable development in relation to the topic areas discussed within the SPD.

3. STANDARDS FOR THE ASSESSMENT

The Building Regulations

The Building Regulations set standards for the design and construction of buildings, primarily to ensure the safety and health for people in or around those buildings, but also for energy conservation and access to and about buildings.

The Building Regulations contain various sections dealing with definitions, procedures, and what is expected in terms of the technical performance of building work. The regulations are split into fourteen technical parts (A to P), which deal with individual aspects of the construction.

Part L: Conservation of Fuel and Power

Part L is the technical standard by which the energy performance of buildings is controlled. It stipulates that reasonable provision should be made for the conservation of fuel and power. This is achieved by controlling the insulation values of building elements, the allowable area of windows, doors and other openings, air permeability of the structure, the heating efficiency of boilers and the insulation and controls for heating appliances and systems together with hot water storage and lighting efficiency. It also sets out the requirements for SAP (Standard Assessment Procedure) calculations and Carbon Emission Targets for dwellings.

General guidance on how to comply with the regulations is given in a series of 'Approved Documents' issued by the Secretary of State. These are intended to provide practical guidance with respect to the technical requirements of the Building Regulations.

The current version of 'Approved Document L: Conservation of fuel and power' is split into four parts:

- Approved Document L1A: Conservation of fuel and power (New dwellings) (2010 edition)
- Approved Document L1B: Conservation of fuel and power (Existing dwellings) (2010 edition)
- Approved Document L2A: Conservation of fuel and power (New buildings other than dwellings) (2010 edition)
- Approved Document L2B: Conservation of fuel and power (Existing buildings other than dwellings) (2010 edition)

As the development comprises only new build housing its energy performance is to be assessed in accordance with Approved Document L1A of the Building Regulations.

4. ENERGY EFFICIENT DESIGN

Optimising energy efficiency is crucial to reducing energy demand and the resultant emission of CO₂ into the atmosphere. The proposal is to reduce energy use through the improved specification delivered in the building fabric and through advanced building controls.

This Section details the proposed approach considered in order to enable compliance with the planning policy requirements for this development. It should be noted that the conclusions drawn within this document are based upon planning drawings and 'Design Stage' SAP calculations informed by the following build specification:

- External wall U-value of 0.28W/m²K
- Floor U-Value of 0.16-0.19W/m²K
- Roof U-value of 0.14W/m²K
- Window U-value of 1.50W/m²K
- Design air permeability of 6 m³/m².h@50Pa
- Accredited thermal modelling of construction details

The approach adopted by Redrow is in accordance with the principles set out in 'The Energy Efficiency Hierarchy' which states that energy demand can be lowered through enhancing the performance of the thermal envelope of the building.

The Energy Efficiency Hierarchy

Upon its introduction in 2003, the Merton Rule constituted the first local authority initiative to specify renewable energy provision for proposed residential development and quickly became accepted as a means of encouraging reduction of carbon emissions and promoting take up of renewable technologies to assist in driving down costs through volume.

As understanding of the challenges involved improved and practical experience accrued, a number of criticisms of the policy emerged, including most importantly that it placed a disproportionate emphasis on contribution from renewables rather than reduction of basic energy demand through improvement in building fabric performance.

Consequently in 2008, The Building Research Establishment's (BRE) Strategic Assessment and Evaluation Team undertook an independent study of the practical, environmental and economic effects of the Merton Rule on behalf of the National House-Building Council (NHBC) Foundation.

Results of the study indicated that:

- Improvement to building fabric and services was the most cost effective way of reducing energy consumption.
- The cost/tonne of achieving a 1.1% reduction in CO₂ emissions with renewables was 4.2 times higher than building fabric improvement.
- Combining improvements to building fabric and services to achieve approximately a 20% reduction in energy use was cheaper per tonne of CO₂ emissions reduced than by achieving a 10% reduction by using renewables alone.

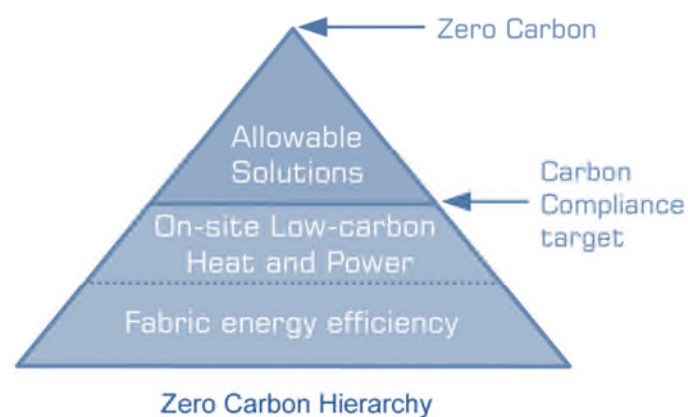
BRE's Strategic Assessment and Evaluation Team concluded that:

"Improvements to building fabric and services should be implemented first with additional renewable energy installations to follow".

“Enhancing the thermal performance of the building envelope helps to future-proof the structure and also yields the greatest CO₂ savings. Adding renewable technologies will then yield maximum emissions reductions with lower long-term costs for the construction industry. This was found to be the most cost effective, holistic solution for achieving the challenging Code for Sustainable Homes energy targets”.

In addition to this it is recognised that the good building principles of fabric first to reduce CO₂ is endorsed and promoted by the Zero Carbon Hub and other NGOs together with technical advisors from Communities and Local Government (CLG) and Department of Energy and Climate Change (DECC).

The diagram below highlights the hierarchy recommended and adopted from the consultation of the definition of Zero Carbon.



Details of the proposed fabric specification can be found in the following sections of the report which investigate the design proposals considered in meeting the 10% target for renewable energy.

Passive solar design

Siting, layout, orientation and design are important factors when ensuring the energy efficiency of new developments. The orientation of dwellings in relation to the sun is important not only in respect of the arrangement of gardens and principal habitable rooms, but also in influencing the potential to reduce energy requirements within the home. Careful orientation of streets and the arrangement of dwellings within them can provide good opportunities for solar gain and daylight penetration to habitable rooms. For example designing for daylighting in the form of appropriately located and sized windows reduces the need for artificial lighting, and designing for passive solar gain reduces the need for internal space heating.

Houses on the development are positioned to limit the extent of overshadowing. The form of the site is low rise, low-density housing and terraces are positioned to minimise the effect of houses overshadowing each other. Special regard is also given to the site’s existing features in order to avoid excessive overshadowing by existing trees, landforms and buildings.

Window design and fenestration is designed to maximise passive solar benefit. Rooms which are occupied for the most time such as lounges use large windows on the principle elevations. The house designs make the best use of daylight by utilising shallow floor plans and roof lighting in some cases. Excessive glazing has been avoided as this leads to disproportionate heat loss in the winter and risk of overheating in the summer.

5. WATER EFFICIENCY

Population growth and lifestyle changes coupled with changes in rainfall patterns have meant that water is becoming a scarce resource in many regions and as a consequence it is also becoming increasingly expensive as mains, sewerage and trade effluent charges rise. Furthermore, water use and energy use are inextricably linked as energy is directly linked to water use at all stages of the supply process and by the end user i.e.

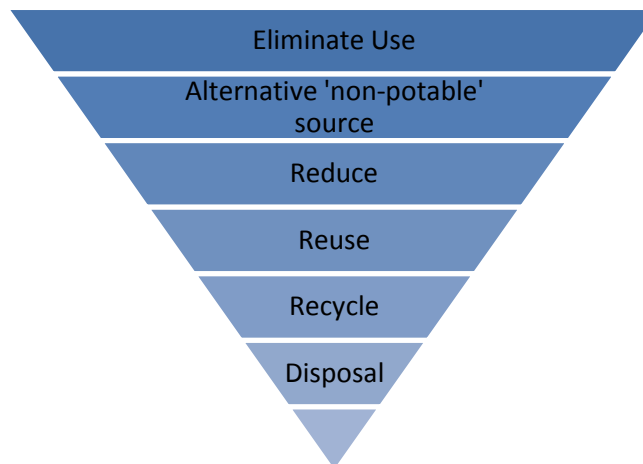
- Water supply (abstraction, treatment and distribution)
- Water consumption (heating of water and water used/pumped)
- Wastewater (sewerage system pumping and wastewater treatment)
- Greenhouse gases emitted in supplying water are 0.30 tonnes CO₂e per Megalitre
- Greenhouse gases emitted in wastewater treatment are 0.75 tonnes CO₂e per Megalitre

Rising energy prices will therefore also add to the cost increase of supplied water and the treatment of used water.

The way we have been using this most important natural resource is clearly unsustainable. Redrow aims to be a responsible company, minimising the impacts of our business on the environment and natural resources. Saving water through efficient design of our products and through careful management during and after construction is an important part of this objective, making financial sense as well as benefiting the environment.

The Water Hierarchy

Redrow's approach to water conservation policy is based upon the industry accepted Water Hierarchy.



Minimising Water Consumption in Design

In the design of our products we incorporate a range of water conservation measures designed to reduce mains water usage in all residential developments.

Where practicable, consideration is given to the potential for the use of reclaimed water through the inclusion of rainwater collection. This may include:

- Water Butts where appropriate, including any outbuildings such as garages or garden buildings integrated into a scheme.

- Underground water storage tanks for rainwater collection and subsequent reuse
- Retention ponds as a rainwater storage facility.

Our design specification includes measures to minimise water consumption to meet a consumption target of 105 litres per person per day, including:

- 149 litre capacity bath
- Aerated flow control fitted to all taps (5 litres/minute other than kitchen and utility 10 litres/minute)
- Dual flush WCs with 4/2.6 litre flush
- Showers fitted with 9 litres/minute flow limiters

Conserving Water during Construction

Redrow's policy towards water conservation during construction is based on the research undertaken by WRAP (Waste and Resources Action Programme) which identified three basic principles for success:

- Measures must be value for money
- Any technology must be robust and able to stand up to the demands of construction sites
- Making savings is very much about behavioural change and habit and this is a process that takes time, therefore technology that actively influences a behaviour change (e.g. incorporation of trigger guns on all hoses) is likely to be more successful than purely behavioural interventions and a mix of approaches is more likely to be successful than considering either behaviour or technology in isolation.

WRAP have identified that the key water using processes on construction sites are:

- Site cabins and temporary accommodation
- Wet trades, such as brickwork, screeding, concreting and plastering
- Groundworks, including grouting and drilling
- Dust suppression, including road and wheel washing
- Cleaning of tools and plant equipment
- Commissioning and testing of building plant and services
- Wash out of ready mixed concrete wagons
- Specialist and high pressure cleaning

Redrow's guidance on water conservation seeks to address these areas.

Water conservation is a measure or range of measures designed to improve the efficiency of water use by reducing usage and wastage. Reducing water demand and usage can be achieved using water recycling, incorporating water saving devices and good management.

Redrow's policy requires that water conservation measures should be used on site wherever practicable and should be considered for incorporation at an early stage of site compound design and site set up. Good site management practice will ensure adherence to policy and site management staff should maintain vigilance at all times as additional opportunities for conservation may present themselves during construction.

6. SUSTAINABILITY AND WASTE MANAGEMENT

Minimising our own impacts on the environment is central to our sustainability policy. We have a group-wide environmental management system in place to ensure: prevention of pollution; legal compliance; resource efficiency; excellent communication and continual environmental improvement.

Redrow embraces the principles of lean construction by maximising the value delivered to the customer whilst minimising waste, improving production certainty for our suppliers and accelerating the construction process.

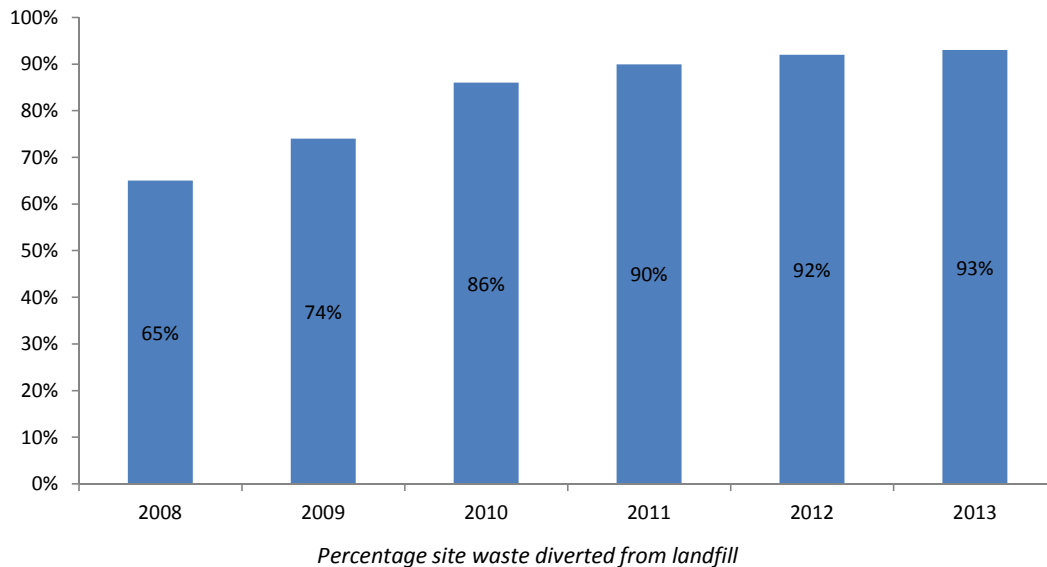
We have employed a waste policy based on the “Reduce, Reuse, Recycle” principle for over 10 years and on-site segregation is undertaken where possible to encourage our sub-contractors to consider the products they are throwing away.

Waste streams from site are reported on in monthly Board documents to enable targeting reduction.

Redrow works with manufacturers to reduce or recycle waste and to reduce the environmental impact of its operations. We have worked closely with British Gypsum to reduce the waste generated on site from plasterboard. On many of our sites, plasterboard is now delivered to site pre-cut to length and surplus board is available to be recycled.

Redrow manages the supply chain at all stages to streamline processes and to ensure appropriate products are built into our homes. We have also embraced E-commerce through paperless ordering and payment systems and also provide ‘just in time’ deliveries.

Redrow’s current site waste re-cycling rate is 93%.



In the financial year ending June 2012 we produced 8.7 tonnes of waste per 100m² of developed floor area against an industry average Environmental Performance indicator (EPI) of 19.2 m³ per 100 m² which equates to just under 12 tonnes per 100m² of developed floor area.

Redrow also considers the ethical environmental performance of its suppliers and sub-contractors. A partnering approach is adopted that clearly sets out the expectations from all

parties and covers issues such as sourcing of materials, transportation and delivery, packaging, health and safety, workforce competency and training and welfare as well as pricing and payment terms.

In contracting with Redrow, they also agree to work in accordance with Redrow's Waste Management Policy and within the requirements of Redrow's membership of the World Wildlife Fund (WWF) UK Forest and Trade Network organisation, as well as meeting our requirements for a customer focussed, professional service.

We currently source 99.53% of our timber from within Category 3 "Licensed Source" to Category 5 "Credibly Certified" and our performance in this specific area has been recognised in the NextGeneration Climate Change Benchmarking analysis as being one of the best in our sector. For more information on the results of the NextGeneration scheme see <http://www.nextgeneration-initiative.co.uk/>.

Information relating to the environmental performance of all our materials and product suppliers is collated, to ensure they are meeting their environmental obligations and are conforming to Redrow's requirements. Additionally, every six months we carry out a comprehensive performance review of our suppliers, which includes many aspects of performance, including the amount and type of packaging used in deliveries to site.

Where possible, Redrow specifies products and materials that generate the least environmental impact, including timber from managed plantations, aggregates from the closest quarries and non-toxic paints.

7. CODE FOR SUSTAINABLE HOMES

Introduction to the Code

The Code for Sustainable Homes (The Code) is an environmental assessment method for rating and certifying the performance of new homes. It is a national standard for use in the design and construction of new homes with a view to encouraging continuous improvement in sustainable home building. It covers nine categories of sustainable design:

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

Each category includes a number of environmental issues, these issues are a source of environmental impact which can be assessed against a performance target and awarded one or more credits. In addition to meeting mandatory standards, achievement of the requirements in each design category scores a number of percentage points. This establishes the Code level or rating for the dwelling.

Each Code level is represented on the certificate by an equivalent number of stars from 1 to 6.

Total Percentage Points Score (equal to or greater than)	Code Levels
36 Points	Level 1 (★)
48 Points	Level 2 (★★)
57 Points	Level 3 (★★★)
68 Points	Level 4 (★★★★)
84 Points	Level 5 (★★★★★)
90 Points	Level 6 (★★★★★★)

Comparison to the Building Regulations

Performance standards for the Code are in line with the current building regulations in some areas but are generally more demanding than the minimum standards needed to satisfy Building Regulations. The Code requirements represent good or best practise and are considered to be technically feasible, and can be delivered by the building industry.

Category 1: Energy and CO₂ Emissions

The aim of this category is to limit CO₂ emissions arising from the operation of dwellings and their services. In order to meet the requirements of PPW, dwelling CO₂ emissions must be compliant with the target emission rate set by the Building Regulations *Part L 2010: Conservation of Fuel and Power* and provide a minimum 8% improvement over the target

emission rate. Redrow dwellings are to be built to a high fabric standard and they include measures such as a well-insulated building envelope and efficient building services to reduce energy demand.

All Redrow homes are provided with energy efficient lighting throughout and any external lighting is installed with daylight cut-off sensors. The boilers installed will be at least 89% efficient as rated by SEDBUK and any appliances that are fitted have at least an A or A+ rating under the *EU Energy Efficiency Labelling Scheme*.

Promoting the use of bicycles as transport can reduce the need for short car journeys thus reducing the associated CO₂ emissions. Redrow homes generally come with a garage and private garden which would be suitable for the secure storage of bicycles. Internal layouts of Redrow houses accommodate enough space to allow a home office setup. Providing occupants with space to work at home reduces the need to commute.

Category 2: Water

The Code for Sustainable Homes aims to reduce the consumption of potable water in the home. All homes will be built in accordance with the Building Regulations *Part G: Sanitation, hot water safety and water efficiency*. Water consumption in all new Redrow homes is limited to 105 litres per person per day by the use of water efficient fittings and flow restrictors.

Category 3: Materials

The materials category of the Code assesses the environmental impact of the materials used in the construction of the dwelling and whether building products are responsibly sourced. It is a Code requirement that a certain percentage of the materials used achieve an A+ to D rating in the *Green Guide* (this is an online tool which provides environmental impact ratings for building constructions and products).

All of the construction types and products used by Redrow have a rating between A+ and D in the *Green Guide*. Suppliers and manufacturers used will generally have certification proving that they have environmental management systems (EMS) in place ensuring that materials are responsibly sourced in accordance with schemes such as BES6001 or ISO14001.

Redrow has also been a member of the WWF GFTN-UK (Global Forest and Trade Network-UK) since 2002 and are committed to tracing their timber back to the source ensuring that it has come from credibly sourced forests. In the last audit (2012) it was found that 99.53% of timber used on Redrow sites was classified within the WWF banding Category 3 'Licensed Source' to Category 5 'Credibly Certified'.

Category 4: Surface Water Run-off

Housing developments must reduce and delay the discharge of rainfall run-off to watercourses and public sewers by using sustainable drainage systems (SuDS). This protects against pollution and minimises the risk of flooding and other environmental damage in watercourses.

The Code asks that all developments are designed in accordance with the *SuDS Management Train* in order to limit the volume and rate of surface water run-off. Additional credits are awarded where the run-off is either completely reduced or receives treatment to reduce pollution. The *SuDS Management Train* is an approach to drainage design that combines a sequence of appropriate surface water drainage structures using SuDS systems for management of the run-off to treat the flow, reduce run-off volume and restrain the run-

off rate in order to minimise impact on the environment. Measures include swales, detention ponds and porous paving.

Flood risk has been taken into account on the development through TAN15 which supplements the policy set out in Planning Policy Wales in relation to development and flooding.

Category 5: Waste

The waste category of The Code covers both construction waste and household waste. It aims to ensure that adequate space is provided for storage of household waste and also to promote the effective management of construction site waste.

Redrow designs allow for appropriate internal recyclable waste storage located within kitchen units. The garden layouts also include suitable hardstanding areas for the siting of waste containers which are provided by Local Authorities. Where apartment buildings are built, their design includes for dedicated refuse storage areas.

To reduce construction site waste Redrow are registered with a site waste management contractor. All developments adopt their site waste management programme and targets. Records of waste groups produced are kept by the site manager and the projects are managed in accordance with the Redrow Homes Waste and Environmental Policy. Redrow diverted more than 93% of construction waste from landfill last year and are continually seeking to improve on this.

Category 6: Pollution

In order to reduce the emissions of gasses with high Global Warming Potential (GWP) the Pollution section of The Code requires that all insulation products used have a GWP of less than 5. Greenhouse gasses are generally given off during the manufacture or installation of insulation products which use a blowing agent, for this reason unfoamed insulation materials have a GWP of 0. All foamed insulation materials within the homes will have a GWP of less than 5.

To promote the reduction of nitrogen oxide (NO_x) emissions into the atmosphere, heating systems used within Redrow houses incorporate gas boilers which emit low levels of NO_x

Category 7: Health and Well-being

This section of The Code covers a series of sub categories which aim to improve quality of life within the home by providing adequate levels of daylighting and sound insulation along with accessible external spaces.

Daylight calculations will be carried out on all house types to ensure that adequate levels of natural lighting are provided in all rooms. This provides a healthy feeling internal environment and reduces the energy demand to light the home.

Sound insulation will be provided in homes in accordance with the Building Regulations *Part E: Resistance to the passage of sound*. This ensures that protection is provided against sound transference from adjoining buildings and rooms within the dwellings.

Redrow developments include areas of private gardens and public open spaces. The Code requires that where private garden spaces are provided to houses, they meet a minimum size requirement of 1.5m² per bedroom. Gardens are normally provided well in excess of this requirement.

Accessibility is also an important part of The Code. All areas of houses and their amenities must be accessible in accordance with BS8300 and the Building Regulations *Part M: Access to and use of buildings*. This is applicable to all dwellings and they will be designed to meet these requirements.

The Lifetime Homes standard was created to promote the construction of homes that are accessible and easily adaptable to meet the changing needs of current and future occupants. It is not compulsory for houses to be built to this standard unless they are required to meet Level 6 of The Code.

Houses on this development are being built to Level 3 of the Code and therefore do not incorporate the Lifetime Homes standard.

Category 8: Management

The Code deals with management of developments both during and after construction. During construction The Code promotes environmentally, socially considerate and accountable management of construction sites. It suggests enrolling on the Considerate Constructors Scheme which is a UK certification scheme that encourages the considerate management of construction sites.

Redrow is committed to being a responsible developer and their Corporate Responsibility agenda along with their own environmental management system (EMS) ensures that all developments are socially considerate and managed in a way that reduces environmental impact. Redrow's environmental management system contains several environmental standards covering issues such as archaeology, contaminated land, noise, dust and water pollution etc.

Post construction, The Code suggests a Home User Guide is provided. Upon handover of a Redrow home the customer is provided with a Home File. A demonstration is given by a sales consultant and details such as emergency information and customer service contact details are provided.

Security is also covered by The Code and *Secured by Design* certification may be sought. It is not a mandatory requirement and can be carried out if needed.

Category 9: Ecology

The Code promotes development on land that already has limited value to wildlife and discourages the development of ecologically valuable sites. Where sites are developed they should incorporate recommendations made by a suitably qualified ecologist in order to enhance the ecological value of the site. Any reduction in ecological value of the site is discouraged and important ecological features should be protected.

The Redrow Environmental Management System will put several measures in place to protect plants and wildlife and ensures that legal requirements, planning conditions and working methods set out by consultants' reports are complied with at all times. Where protected species are discovered, expert advice is taken on how to proceed with work. The Redrow Environmental Management System sets out ways to avoid problems with wildlife and how to deal with key animals and plant species.

Code Pre-assessment summary

The following table summarises the potential scoring of a typical house and flat on this development. These scores are based on a number of assumptions as well as experience from previous Code assessments carried out on these house types. This should provide a broad indication of how the criteria will be met and a likely method that will be adopted to meet Code Level 3. The allocation of credits is liable to change as the design evolves, though the mandatory elements of the Code will need to be met regardless of the scoring in other categories.

Dwelling Type ⇨		Max Credits		
		for Issue ↓	House	Flat
Ene1	Dwelling Emission Rate (DER)	10	1.1	1.5
Ene2	Fabric Energy Efficiency (FEE)	9	3.6	5.3
Ene3	Energy Display Devices	2	2	2
Ene4	Drying Space	1	1	1
Ene5	Energy Labelled White Goods	2	1	1
Ene6	External Lighting	2	2	2
Ene7	Low/Zero Carbon (LZC) Technologies	2	0	0
Ene8	Cycle Storage	2	0	0
Ene9	Home Office	1	1	1
approx. Ene credit value		1.17	13.73	16.20
Wat1	Indoor Water Use	5	3	3
Wat2	External Water User	1	1	1
approx. Wat credit value		1.50	6.00	6.00
Mat1	Environmental Impact of Materials	15	12	10
Mat2	Sourcing Materials - Basic Building Elements	6	0	0
Mat3	Sourcing Materials - Finishing Elements	3	3	3
approx. Mat credit value		0.30	4.50	3.90
Sur1	Management of Surface Water Runoff	2	1	1
Sur2	Flood Risk	2	2	2
approx. Sur credit value		0.55	1.65	1.65
Was1	Storage of Non-recyclable / Recyclable Waste	4	4	4
Was2	Construction Site Waste Management	3	3	3
Was3	Composting	1	1	0
approx. Was credit value		0.80	6.40	5.60
Pol1	Global Warming Potential of Insulants	1	1	1
Pol2	NOx Emissions	3	3	3
approx. Pol credit value		0.70	2.80	2.80
Hea1	Daylighting	3	3	3
Hea2	Sound Insulation	4	4	3
Hea3	Private Space	1	1	1
Hea4	Lifetime Homes	4	0	4
approx. Hea credit value		1.17	9.33	12.83
Man1	Home User Guide	3	3	3
Man2	Considerate Constructors Scheme	2	2	2
Man3	Construction Site Impacts	2	2	2
Man4	Security	2	0	0
approx. Man credit value		1.11	7.77	7.77
Eco1	Ecological Value of Site	1	0	0
Eco2	Ecological Enhancement	1	1	1
Eco3	Protection of Ecological Features	1	1	1
Eco4	Change in Ecological Value of Site	4	2	2
Eco5	Building Footprint	2	0	0
approx. Eco credit value		1.33	5.33	5.33
Total Achieved Score			57.51	62.08
CSH Level			3	3

8. REFERENCES

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