



Leasbrook, Dixon, Monmouth

Redrow Homes South Wales

Monmouthshire County Council RLDP

Tackling Climate Change – assessment of site opportunity

August 2021

Leasbrook, Dixon, Monmouth

Redrow is promoting a 30 acre parcel of land for residential development on the north east edge on Monmouth town. The site provides opportunity for measures to assist in tackling climate change to be implemented.

This paper looks at the issues set out in paragraph 6.2 of Monmouthshire County Councils (MCC) Candidate Site Advise Note on Tackling Climate Change. The paper advises candidates sites should consider how they can work towards net zero carbon within the following categories

- Reducing Energy Demand
 - Site Layout and Design
 - Building Layout
 - Energy Efficient Building Fabric
 - In Home Energy Efficient Measures
- Energy Generation and Storage
- Decarbonising Heating Systems – Low carbon / Renewable and District Wide Heating Networks
- Sustainable Transport and Electric Vehicle Charging Infrastructure

The Redrow Philosophy

The Redrow philosophy focuses on creating a better way for people to live. Our approach is achieved via three key standards, detailed within the Redrow 8 document, - Building Responsibly, Thriving Communities and Valuing People. These over-arching standards are aligned to the United Nations Sustainable Development Goals (UNSDG). The UNSDG aims to achieve a better global future by addressing key social and environmental challenges such as health & wellbeing and biodiversity. More on this can be found on the Redrow website at:

<https://www.redrowplc.co.uk/sustainability/our-approach/>

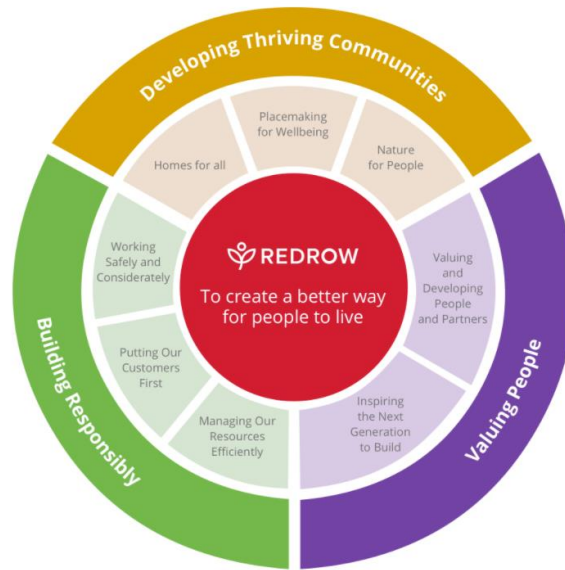


Figure 1: The Redrow 8 over-arching standards

The Redrow 8 document creates a framework and assessment system to ensure that the overarching standards (shown in Figure 1 above) and the 8 principles that fall within those, are applied to all of our future developments.

In seeking to meet and deliver on this philosophy, Redrow has delivered many initiatives that contribute to tackling climate change. Since 2014, Redrow has made significant strides in its sustainability efforts, having reduced core emissions by 10% year on year. In response to this the Financial Times have recognised these efforts and subsequently named Redrow as one of Europe's Climate Change Leaders (2021):

Julia Green, recently appointed Head of Sustainability at Redrow, commented on the achievement: *"We're thrilled to have been recognised by the Financial Times as one of Europe's Climate Leaders. As the climate emergency comes into sharper focus, there is more that Europe's largest businesses can be doing to reduce emissions, and we will continue to push the boundaries of sustainable operations. We are committed to playing our part in the UK's transition to net-zero, with the development of our zero carbon roadmap and reduction targets".*

In a practical sense Redrow have many initiatives underway that come together to create sustainable and thriving communities.

Site Layout and Design

Redrows site layout and design is all about creating sustainable communities. Our work is guided by the Redrow 8 document, and its 8 design principles set within. For our Welsh division Redrow have created 'Redrow 8 Wales'. This document places more emphasis on the Welsh Government's Placemaking priorities. The Redrow 8 Wales design principles are set out in Figure 2 below:

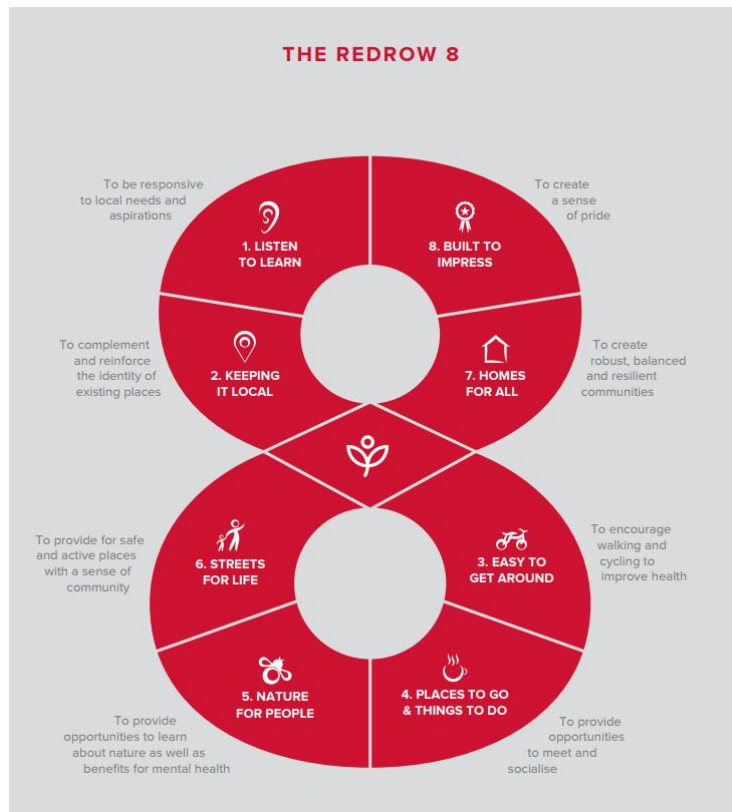


Figure 2: Redrow 8 Wales principles

Redrow 8 Wales is focused largely on sustainability and tackling climate change, whilst sharing a flavour of the commitment Redrow offers. In terms of reducing energy demand in Placemaking this can largely be achieved by reducing or minimising the need for travel, and more importantly reducing the need to travel by car. Redrow prioritise development sites that are located near to existing community facilities, or sites that can incorporate the provision of new community facilities and services as part of the development proposal. By ensuring new residents have local services and facilities available to them, this discourages the need for car travel and the shorter distances encourage the use of active travel modes.

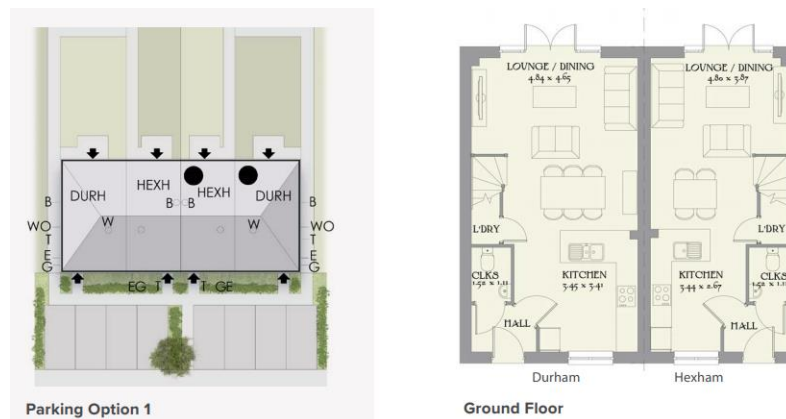
While Redrow 8 Wales sets out Placemaking principles, the company also has layout guidelines set out in our Plotting Manual, Landscape Manual and Nature for People Guide. These are used by the layout design teams to secure efficient plotting as well as creating high quality environments. There is emphasis on placing new homes within environments that also support nature, whilst encouraging increased biodiversity and facilitating food growing, where appropriate.

The site offers opportunities for layout based energy reduction. Ensuring a network of walking and cycle routes into existing nearby services and facilities located within Monmouth town centre will be critical. In addition, through directional plotting, Redrow can capture natural sun heat and in particular implement appropriate planting in conjunction with an on-going green infrastructure management strategy, to support and enhance biodiversity.

Building Layout

It is likely that Redrow will seek to use its Heritage Collection of house types at the proposed site. The collection has been developed to offer a range of homes to suit many different lifestyles and age groups. The homes also seek to assist with Reducing Energy Demand in the following ways:

- Having space within many of the house types to provide for home working and / or home schooling;
- The ability to purchase an office for the garden; and
- Having an open plan ground floor back area, with large patio / bi-fold doors that captures warmth from the sun to assist in heating the home. See example below:



Energy Efficient Building Fabric

Our group-wide design standards apply to all our homes and go beyond regulations and material sustainability standards in many instances. For example to minimise sound impacts we use of robust Standard Details which exceed Building Regulation requirements by 3 dB. All windows are 1.2U-Value and all doors are 1.0 U-value. All floors are 0.12max U-value. All roofs are 0.11 U-value: all improvements upon standard requirements. Our homes are designed for improved daylighting and solar gains by adding larger than standard patio doors and windows.

Redrow's standard specification includes low embodied carbon products. Examples of some of these innovative products are detailed below:

- Roofing tiles: use of innovative interlocking concrete tiles that require 45 Kg of raw materials per square meter in the manufacturing process, while plain tiles require 75kg of raw materials per square meter. This reduces the CO2 emissions during manufacture by 40% compared to concrete plain tiles.
- Concrete roof tiles in place of clay tiles: the embodied energy of clay tiles is 270 – 430 MJ/m² while for concrete it is 40 – 90 MJ/m².
- Aircrete concrete blocks: up to 80% of the raw materials used in the manufacture of the blocks are recycled products in some form, with the primary ingredient being Pulverised Fuel Ash (PFA) which is a by-product of coal fired power stations that would otherwise be sent to landfill. 99% of all raw materials are sourced from UK suppliers, reducing the need for transportation, and the manufacturing sites are strategically placed geographically close to raw material suppliers and convenient for quick and effective deliveries to all parts of the country.
- Gypsum plasterboard: produced by using either natural gypsum, synthetic gypsum (from desulphurising the flue gas of coal-fired power plants) or recovered gypsum from the waste-recycling chain. Extracting natural gypsum does not require much energy and mines in use are continuously restored in order to preserve the natural site and its biodiversity. Almost 100% of the paper used to manufacture plasterboards is recycled paper.
- Locally recycled aggregates
- Redrow has been working for more than fifteen years to promote responsible forest management and ensure the eradication of illegal timber products from our supply chain which has paid off as currently 99.9% of our timber is responsibly sourced and credibly certified.

In addition Redrow continually seeks reduce the impacts from waste. A waste reduction project across the business is being developed. Redrow are also members of the HBF Waste Forum, to tackle waste and inefficiency in house building and we are also working collaboratively with the Community Wood Recycling scheme to increase the reuse of waste wood on our sites, in line with circular economy principles. Redrow measure our waste production and monitor the percentage of waste diverted from landfill. This includes construction, demolition and excavation waste; as set out within Redrow's internal waste policies and procedures. Additionally, we verify our waste data internally and externally to ensure that it is accurate.

Redrow are also active members of the Supply Chain Sustainability School's Carbon Special Interest group, working with our industry peers to drive a reduction in carbon emissions from the supply chain

through products, works and services procured. Phase one of the project is already underway and involves the collection of energy and carbon data from key suppliers into a bespoke online tool. The collection of this data will help us in calculating the greenhouse gas emissions from our supply chain that are attributable to.

The building and construction sector must tackle the emissions created from the entire building lifecycle. At Redrow, we aim to minimise consumption of virgin raw materials and maximise the value and lifespan of all materials, resources and products in our supply chain. Redrow is looking to meet its 2022 target to reduce the waste intensity of its construction operations by 10% and has reduced the total tonnage of waste produced per 100m² build from 10.65t in 2017 to 8.11t in 2021.

In 2020, Redrow launched the Reduce the Rubble project to help further drive down waste. The initiative was a UK-first in that it sought to drill down and identify every single component of waste generated during the housebuilding process, with precise waste types captured and logged. The project was driven in part by customer attitudes, with a Redrow survey identifying that 64% of its consumers were more likely to buy from a company that was actively looking, or already had, reduced its levels of waste.

Redrow selected its 'Oxford' house type for the project; one of its most popular homes – a detached, four-bedroom family residence, typical of the company's 'Heritage Collection' homes. Gaining a detailed knowledge of the type and volume of waste produced in building the Oxford would allow Redrow to better understand what causes it and identify how it might either be recycled or reduced during the procurement, design and construction stages. We were able to identify our key waste streams and causes of waste. More than 30 improvement opportunities were identified from the project and we are currently in the process of implementing some of these.

In Home Energy Efficient Measures

Redrow as standard provides the following energy and other resource efficient measures and facilities:

- Low energy boilers
- Low energy light bulbs
- Low energy usage white goods (supplied with kitchens as standard)
- Water limiting features in baths and showers and flushes. Our homes have one of the lowest water use standards in the industry at 105 litres-per-person-per-day (lpppd), compared with a building regulation standard of 125 lpppd.

Other energy efficient measures are currently being tested with the objective that additional features will be included in future house specifications.

Redrow are running trials with new low carbon technologies. Called Project Wondrwall, the first gas free home (Oxford house type) will be completed in summer 2021 at a site in Yorkshire (The Grange).

The components of Wondrwall (solar PV, full home-automation, battery, infrared panel heating and a smart hot water cylinder) will replace the traditional gas boiler and radiators used in our current homes. The Wondrwall technology uses artificial intelligence to reduce energy consumption and maximise the use of renewable energy, generated from its own solar energy system.

Once completed the home will be occupied and energy usage monitored. Simultaneously a regular Oxford house type will be monitored for energy use so that comparisons can be made and thus inform Redrows future approach to low-carbon homes.

Redrow are installing innovative community energy infrastructure on sites like Saxon Brook in Devon and Colindale, London. Once completed, the community energy project at Saxon Brook alone will be saving 4,173 tonnes of tonnes of CO2 per year, which is 64% less than an equivalent development with traditional individual home energy systems required for a traditional development of that size. Saxon Brook district heating is owned and managed by EON and forms part of the wider Cranbrook and Skypark developments – a new settlement east of Exeter. District wide heating systems need large scale and mixed use developments to function well.

Sustainable Transport and Electric Vehicle Charging Infrastructure

For many years Redrow in South Wales has been promoting our new developments proposals by advocating provision of active travel and then pubic transport options over car based travel improvements. As developers Redrow have been at the forefront of such thinking with several appeals being allowed where such arguments were supported by PINS (Churchlands Ref: APP/26815/A/14/2224216 and Hendredenny APP/K6920/A/16/3160099). The Redrow developments at Churchlands and especially Plasdwr in Cardiff (both in delivery stages) have their whole transport system based only on improvements for walkers, cyclists and public transport users. There were no improvement measures aimed at benefitted car users.

Sustainable transport should begin with (1) not needing to make your journey at all eg home working or shopping or (2) being able to make that journey locally by having facilities and services nearby. The point being that no 'transport' is actually needed. It should be noted that many household needs can be satisfied more readily these days without the need to move far. Good place making starts with minimising trips by firstly ensuring that development sites boast local facilities and services and then ensuring opportunities for walking and cycling to such. Public transport routes, regularity of services as well as quality and safety of provision must also be satisfactory to encourage usage. Finally Redrow look to influence the behaviour of our future occupiers through travel packs. These aim to explain the options for travel and we are increasingly providing new residents with vouchers for bike purchases or bus passes to encourage sustainable travel from the outset.

The Vectos paper for Leasbrook explains the active travel and other sustainable transport opportunities for the site. The land is on the edge of Monmouth and in close proximity to the town centre and all that it has to offer. There are opportunities to connect the site to the main town for walking and cycling, thus encouraging sustainable active travel choices.

Redrow are willing to install EV charging facilities into every private home. The first development with such provision is underway in Caerleon, Newport. Redrow is also willing to discuss with the council the provision of public charging facilities at Leasbrook where Monmouthshire County Council or another appropriate body takes on the future management of such.

Going Forward

Redrow are continually reviewing and making improvements to its residential developments through research and testing. Decarbonisation is currently our main focus as a business, and there will be various measures that will be brought forward over the coming years. As these start to roll out this paper can be updated and shared, providing more detail and assurances on the additional measures that Redrow can commit to as part of the delivery of Leasbrook.