



PROPOSED RESIDENTIAL DEVELOPMENT

Westgate, Cleckheaton

SUSTAINABILITY STATEMENT



August 2021

Introduction

This report has been prepared by Award Energy Consultants on behalf of Strata Homes for the proposed development of 194 new build dwellings at Westgate, Cleckheaton. This statement has been produced to address Kirklees Council's Local Plan Policy LP 24 and highlights the key sustainability features to be incorporated into the development to enhance sustainability.

Policy Context

The following documents were considered:

Building Regulations 2013 – As new build dwellings, Part L1A is of particular note. Part L1A sets minimum standards for fabric and energy efficiency for new build dwellings

National Planning Policy Framework 2021 – strengthens the emphasis on sustainable development, and requires new developments to secure the highest viable resource and energy efficiency and reduction in emissions by considering Governments and other national standards

Kirklees Council's Local Plan Policy LP24: Design - encourages high levels of sustainability to mitigate the effects of climate change

Renewable Technology Analysis

Strata Homes have considered the possibility of utilising renewable technology for the development at Westgate. The matrix table below shows the feasibility study that was undertaken to understand the opportunities available for the application of renewable technologies.

Technology	Evaluation
Wind turbines	The national wind database for the site suggests that the average wind speed on the site will be 5.3 m/s at 10 m above the ground. Micro-wind turbines generally have a low-level cut off speed of c. 4 m/s which will result in any turbine only operating for a small proportion of the year. There may also be issues with vibrations and noise for residents in addition to having an adverse impact on the visual amenity for residents and neighbours. Wind technology is therefore not considered appropriate for the development.
Solar Hot Water (SWH)	Solar Hot Water panels could not provide a sufficient effective contribution to offset energy requirements for hot water within the building due to the excellent efficiencies within the proposed heating systems.
Biomass Heating (including Biomass CHP)	Biomass boilers can provide a cost-effective contribution to the building space heating and hot water demand. However, biomass boilers would be used through a central energy centre strategy which is excessively complex for this type of development. Lack of space for storage of pellets is also a consideration. In addition, biomass would result in regular heavy transportation vehicles to the site and the increased levels of noise and air pollution associated with this technology is not considered suitable for the development.
Air Source Heat Pumps (ASHPs)	ASHPs can provide low grade heat potential for the buildings, albeit with an increase in the carbon footprint. However, Air Source Heat Pumps are not suitable for schemes such as the development at Westgate due to space and noise considerations
Ground Source Heat Pumps (GSHPs)	GSHPs are not a suitable technology for large scale developments due to space considerations and marketability.
Photovoltaics (PV)	Photovoltaics can provide an efficient means of electricity generated, however, the visual impact of panels on the roofs would be unacceptably significant.
Small Scale Hydro	There are no suitable watercourses at or near the development site.

As a result of the above analysis, Award Energy have also looked at the potential carbon and energy savings that can be achieved through an enhanced fabric specification to embed the energy efficiencies within the dwellings, in line with Government's Energy Hierarchy. The proposed Fabric-First Energy strategy recognises that it is inherently more sustainable to invest resources in reducing a property's long-term carbon emissions than shorter term generation benefits.

Method

To evaluate the anticipated sustainability strategy, Award Energy have compared the specification that will achieve minimum compliance with Part L1a 2013 with the intended enhanced specification, as shown in Table 1 below. Within the enhanced specification, heat loss elements have been insulated beyond regulation requirements and regulated u-values for external walls, floors and roofs have been surpassed. A design air pressure test of 5.01 has also been specified and highly efficient boilers have been included with high specification heating controls.

Table 1

Element	Value required by Part L1a 2013* (u-value)	Enhanced specification (u-value)
Walls (w/m ² k)	0.30	0.25
Roofs (w/m ² k)	0.20	0.11
Floors (w/m ² k)	0.25	0.16
Windows (w/m ² k)	2.0	1.30
Doors (w/m ² k)	2.0	1.20
Design air pressure test (m ³ /h/m ²)	10	5.01

* For U-values: See Approved Document L1a 2012

Energy Demand Reduction Calculations

The Target Fabric Energy Efficiency (TFEE) has been used as a Baseline against which to measure specification performance. The comparison of the Dwelling Fabric Energy Efficiency (DFEE) against a notional Target Fabric Energy Efficiency (TFEE), as calculated via SAP 2012, is currently the only mandatory Building Regulatory requirement which specifically relates to energy. This approach, therefore, appears the most logical. The Fabric Energy Efficiency ratings DFEE and TFEE (as developed by the Zero Carbon Hub and implemented into Building Regulations Part L1a 2013) are defined as the space heating and cooling requirements, per square metre of floor area, per year, for the as-defined and notional dwelling, respectively, and are measured in units of kWh/m²/year.

Using SAP2012 software and the specification detailed in Table 1, the predicted energy demand for each house type in kWh/m² per year was calculated, as shown in Table 2 below.

Table 2

Property Type	Energy Consumption (kWh/m ² /yr) Baseline specification TFEE	Energy Consumption (kWh/m ² /yr) Enhanced specification DFEE	% reduction in Energy Consumption
Detached	61.85	53.10	14.16%
Semi Detached	49.63	42.60	14.16%
Mid Terrace	41.93	33.65	19.77%

*calculated using SAP2012 software. Award Energy can, upon request, provide reports from SAP2012

Energy Demand Reduction Calculations cont.

The baseline weighted average predicted energy demand for the site was then calculated to be 49.57 kWh/m²/yr (with all properties meeting the minimum requirements of Part L1a 2013). The weighted average predicted energy demand with Strata Homes' enhanced specification is 42.01 kWh/m²/yr – a **15.25%** reduction in site-wide energy requirements over the 2013 Building Regulations.

Table 3

Property Type	No	Energy Consumption (kWh/m ² /yr) Baseline specification TFEE	Energy Consumption (kWh/m ² /yr) Enhanced specification DFEE
Detached	28	8.66	7.43
Semi Detached	122	31.27	26.84
Mid Terrace	44	9.64	7.74
	194		
Weighted Average		49.57	42.01
Site-wide weighted average energy demand (kWh/m²/yr) = 15.25 %			

*calculated using SAP2012 software. Award Energy can, upon request, provide reports from SAP2012

Not only will the specification deliver the aspirations of Kirklees Council's Planning Policies and the National Planning Policy Framework 2019, but it will also serve to last the lifetime of the development with no future maintenance issues.

Results of Carbon Reduction Calculations

Award Energy have compared the specification that will achieve minimum compliance with Part L1a 2013 with the intended enhanced specification as detailed in Table 1. Table 4 below shows the predicted Carbon Emissions for the proposed house types, with Table 5 demonstrating the weighted across the site to take account of the mix of house types

Table 4

House Type	Carbon Emissions (KgCO ₂ /Year/m ²) Baseline specification	Carbon Emissions (KgCO ₂ /Year/m ²) Enhanced specification	% reduction in Carbon Emissions
Detached	18.00	17.87	0.74%
Semi Detached	17.87	16.86	5.67%
Mid Terrace	17.02	15.19	10.72%

*calculated using SAP2012 software

Results of Carbon Reduction Calculations cont.

Table 5 below shows the weighted predicted Carbon Emissions for each house type, reflecting the mix for the development. The baseline weighted average predicted carbon emissions for the site are 17.69 KgCO₂/Year/m² (with all properties meeting the minimum requirements of Part L1a). The total predicted carbon emissions with Strata Homes' enhanced specification are 16.62 KgCO₂/Year/m² – a **6.05%** reduction in site-wide carbon emissions.

Table 5

House Type	Number	Weighted Average Carbon Emissions (KgCO ₂ /Year/m ²)	Weighted Average Carbon Emissions (KgCO ₂ /Year/m ²)
		Baseline specification	Enhanced specification
Detached	28	2.52	2.50
Semi Detached	122	11.26	10.62
Mid Terrace	44	3.91	3.50
Total	194	17.69	16.62
Weighted Average Carbon Emission Reduction = 6.05%			

*calculated using SAP2012 software

Material Selection

Significant amounts of energy and natural resources are consumed in the production, transportation and disposal of building materials. Two issues are significant in the specification of building materials; the environmental impact of materials and the responsible sourcing of materials. Strata Homes are dedicated to taking pro-active measures to address these issues and commit to obtaining responsible sourcing certification for at least 90% of the building elements of each dwelling.

Pollution

The dwellings will be constructed with insulating materials that have a Global Warming Potential of less than 5. In addition, all dwellings will be heated by highly efficient gas boilers, with those that have NOx emissions of less than 40 mg/kWh being considered.

Travel, Highways and Access

Policies LP20 and LP21 are addressed by Andrew Moseley Associates Reports 20664-001 and 20664-002 submitted separately

Waste

Strata Homes have company-wide policies to promote the reduction and effective management of construction related waste. Robust procedures are in place to share materials such as soil and aggregate between sites and to sort waste on and off site to divert waste from landfill.

All construction activities will be carried out to minimise dust, fumes, discharges and any other form of pollution on site, in line with best practice policies.

Passive Design

Consideration has been given to the orientation and layout of the buildings to help maximise energy efficiency as part of the development.

The layout has also been designed to maximise a north-south orientation to allow for passive design whereby dual aspect dwellings enable views, good daylighting and cross ventilation. Each of the principal living rooms has sufficient glazing to allow natural light to penetrate into the rooms. Numerous studies have shown this to be beneficial to the general health and happiness of occupants

- Hard landscaping has been minimized as much as possible to maximize soft landscaping thus providing natural and localized infiltration
- The site has been designed to promote sustainable travel making connections to established local transport links, cycle and pedestrian routes
- The construction specification of every home will include high levels of insulation in the ground floor, external walls and roof spaces
- Internally, the accommodation has been laid out to maximise the internal space and light afforded, with primary habitable rooms benefitting from a southern orientation. Each of the principal living rooms will have sufficient glazing to allow natural light to penetrate the rooms, reducing the need for artificial lighting. Overheating risk will be addressed through high quality glazing and an appropriate ventilation strategy
- An efficient gas condensing boiler will be installed in each property. The heating designs of each house type will include dual zone controls with delayed start thermostats, where possible
- Energy efficient lamps will be installed in every light fitting. Each entrance will be illuminated with an energy efficient external light or provision will be made for a purchaser to install such a fixture
- Each property will also have a designated space for refuse and recycling in the rear garden or as a purpose-built store to the front of the property.
- Mitigation of flooding risk is incorporated in the site design and is addressed in a Flood Risk Assessment by Eastwood & Partners (Report Ref 45538-0001), submitted separately to meet the requirements of LP27 and LP28
- Electric Vehicle Charging Points or Bollards will be provided for each dwelling.
- All houses will have access to a private garden and garden areas will be fully accessible for disabled occupants, where possible.

Water Efficiency

The average person in England and Wales uses 150 litres of water a day. By 2020 the demand for water could increase by 800 million extra litres of water a day. Most of this water is used for washing and toilet flushing, but it also includes drinking, cooking, car washing and watering the garden. Using water in our homes contributes around 35 million tonnes of greenhouse gases a year. The Approved Document G (2010) restricts new build dwellings to a maximum consumption of 125 litres per person per day. It is proposed that eco-sanitary ware and restricted flow rates will be introduced into the design of each development to obtain the appropriate level of water efficiency.

The following table has been extracted from the Water Efficiency Calculator, demonstrating that a higher level of efficiency than that required by the Building Regulations will be achieved.

Water Consumption

Installation Type	Unit of Measurement	Capacity/Flow Rate	Use Factor	Fixed Use	Litres Per Person per day
WC (Dual Flush)	Full Flush (litres)	6	1.46	0.00	8.76
	Part Flush (litres)	4	2.96	0.00	11.84
Taps (excluding kitchen tap)	Flow rate (litres/minute)	6	1.58	1.58	11.06
Baths (where shower present)	Capacity to overflow (litres)	195	0.11	0.00	21.45
Showers (where bath present)	Flow rate (litres/minute)	10	4.37	0.00	43.7
Kitchen sink tap	Flow rate (litres/minute)	3.8	0.44	10.36	12.03
Washing Machine	Litres/kg dry load	8.17	2.1	0.00	17.16
Dishwasher	Litres/place setting	1.25	3.60	0.00	4.50
	TOTAL				130.50
Total Internal Water Consumption		130.50			
Normalisation Factor (x 0.91)		118.75			
External Use		5.00			
Part G Water Consumption		123.75			

Conclusion

This report demonstrates that the proposed enhanced fabric specification reduces average fabric Energy Demand on the site by **15.25%** and the average predicted Carbon emissions by **6.05%**. Water consumption per person per day is anticipated to be less than that required by Building Regulations and sustainable measures are proposed that are in line with Kirklees Council's Policy LP24 and the National Planning Policy Framework 2021, which emphasises sustainable development, energy efficiency and reduction in carbon emissions. Strata Homes' proposed sustainability strategy for Westgate, Cleckheaton places great importance on the efficiency of a property's thermal envelope and internal building services, therefore ensuring that each dwelling on the development benefits from built-in energy reduction measures with no future maintenance issues.

Caveat

This document has been prepared for the titled project, or named part thereof, and should not be relied upon or used for any other project or part as the case may be, without an independent check being made on it. Award Energy shall not be liable for the consequences of using this document other than for the purpose for which it was commissioned, and any user and any other person using or relying on this document for such other purpose, agrees and will be such use or reliance be taken to confirm this agreement to indemnify Award Energy for all loss of damage resulting therefrom.