PROPOSED RESIDENTIAL DEVELOPMENT

BARROW ROAD, BARTON UPON HUMBER

SUSTAINABILITY STATEMENT

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Version 1.1

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Introduction

This report has been prepared by Award Energy Consultants on behalf of Strata for the proposed development of 173 new build dwellings at Barrow Road, Barton upon Humber. This statement has been produced to address North Lincolnshire Council's Core Strategy Policies on Climate Change and highlights the key features to be incorporated into the development to enhance sustainability.

Policy Context

The following documents were considered:

Building Regulations Part L1 2021 – Part L1 sets minimum standards for fabric, energy efficiency and carbon emissions 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

North Lincolnshire Council's Core Strategy 2011 Policy CS2: Delivering more Sustainable Development- encourages high levels of sustainability to mitigate the effects of climate change

North Lincolnshire Council's Core Strategy 2011 Policy CS5: Delivering Quality Design – developments are expected to maximise opportunities to incorporate sustainable design features where feasible

North Lincolnshire Council's Core Strategy 2011 Policy C18: Sustainable Resource Use and Climate Change – promotes development that utilises natural resources as efficiently and sustainably as possible.

Proposal

In order to evaluate the proposed energy strategy, it is important to determine firstly the baseline. This is the level of energy efficiency against which any strategy must be judged using a selection of proposed typical house types and the standard specification that shows compliance with Building Regulations.

Award Energy have compared this specification that will achieve minimum compliance with Part L1 2021 with the intended enhanced specification, as shown in Table 1. Within the enhanced specification, all heat loss elements have been insulated beyond regulation.

Table 1

Element	Value required by AD Part L1 2021 (u-value)	Enhanced specification (u-value)
Walls (w/m²k)	0.26	0.20
Party Walls (w/m²k)	0.20	0.00
Roofs (w/m²k)	0.16	0.09/0.16
Floors (w/m²k)	0.18	0.12
Windows (w/m²k)	1.6	1.3
Doors (w/m²k)	1.6	1.3
Design air pressure test ($m^3/h/m^2$)	8	4.5

Renewable Technology

In the absence of a local District Heating Network, Strata propose to install renewable technology in the form of Photovoltaic panels, along with appropriate Waste Water Heat Recovery systems where feasible. Table 2 below shows the anticipated amounts of photovoltaics in kWp to be applied to each house type.

Table 2

House Type	Photovoltaics Per Plot kWp (approximate)
Mid-Terrace	1.40
Semi-Detached	0.95
Detached	2.35

Fabric Energy Demand Calculations

Using SAP10 software and the specification detailed in Table 1, the predicted fabric energy demand for each house type in kWh/m^2 per year was calculated, as shown in Table 3 below. This fabric first approach is essential to reduce Energy Demand (Step 1 of the Energy Hierarchy) through in-built measures before considering the efficiency of the mechanical services and the application of renewable technology.

Table 3

House Type	Fabric Energy Demand (kWh/m²/yr) Part L1 2021 Baseline specification TFEE	Fabric Energy Demand (kWh/m²/yr) Part L1 2021 Enhanced specification DFEE	% Reduction in Fabric Energy Demand
Mid-Terrace	30.11	29.21	2.99%
Semi-Detached	33.87	32.35	4.49%
Detached	43.23	42.51	1.67%

*calculated using SAP10 software

As outlined in Table 4 below, the baseline weighted average predicted fabric energy demand for the site was then calculated to be **34.47 kWh/m²/yr** (with all properties meeting the minimum requirements of Part L1 2021). The weighted average predicted fabric energy demand with Strata's enhanced specification is **33.10 kWh/m²/yr** – a **3.99%** improvement over the 2021 Building Regulations (approximately 18.99% over Part L1a 2013).

Table 4

Property Type	No	Fabric Energy Demand (weighted) (kWh/m²/yr) Part L1 2021 Baseline specification TFEE	Fabric Energy Demand (weighted) (kWh/m²/yr) Part L1 2021 Enhanced specification DFEE
Mid-Terrace	17	2.96	2.87
Semi-Detached	138	27.02	25.81
Detached	18	4.50	4.42
Total	**173**	**34.47**	**33.10**
Weighted Average Fabric Energy Demand Reduction = 3.99%			

*calculated using SAP10 software. Award Energy can, upon request, provide reports from SAP10.

Carbon Reduction Calculations

Award Energy have compared the specification that will achieve minimum compliance with Part L 2021 with the intended enhanced specification as shown in Table 1 plus the application of approximately 246.7 kWp of Photovoltaic panels across the site on the most appropriate plots. Table 7 below shows the predicted Carbon Emissions for the proposed house types.

Table 7

House Type	Carbon Emissions ($KgCO_2/Year/m^2$) Part L1 2021 Baseline specification TER	Carbon Emissions ($KgCO_2/Year/m^2$) Part L1 2021 Enhanced specification DER	% Reduction in Carbon Emissions
Mid-Terrace	9.59	9.26	3.44%
Semi-Detached	11.02	10.54	4.36%
Detached	11.09	11.00	0.81%

*calculated using SAP10 software. Award Energy can, upon request, provide reports from SAP10.

Table 8 below shows the predicted Carbon Emissions for each house type, weighted to represent fairly the mix on site. The predicted baseline weighted carbon emissions for the site are **10.89 $KgCO_2/Year/m^2$** (with all properties meeting the minimum requirements of Part L1 2021). The average predicted carbon emissions with Strata's enhanced specification plus the application of approximately 197.2 kWp of Photovoltaic panels site-wide are **10.46 $KgCO_2/Year/m^2$**, representing a **3.90%** reduction in site-wide carbon emissions over Part L1 2021 (34.90% over Part L1a 2013).

Table 8

House Type	Number	Weighted Average Carbon Emissions ($KgCO_2/Year/m^2$) Part L1 2021 Baseline specification TER	Weighted Average Carbon Emissions ($KgCO_2/Year/m^2$) Part L1 2021 Enhanced specification DER
Mid-Terrace	17	0.94	0.91
Semi-Detached	138	8.79	8.41
Detached	18	1.15	1.14
Total	**173**	**10.89**	**10.46**
Weighted Average Carbon Emission Reduction = 3.90%			

*calculated using SAP10 software. Award Energy can, upon request, provide reports from SAP10.

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.
- 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 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 dwelling 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**

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 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.

Waste

Strata 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.

Conclusion

This report demonstrates that the proposed enhanced fabric specification reduces average fabric Energy Demand on the site by **3.99%** and, along with the application of renewable technology, leads to a reduction in the average predicted carbon emissions by **3.90%** over the new Part L 2021. Thermal elements will be significantly improved beyond than the requirements of Building Regulations and sustainable measures are proposed that are in line with the National Planning Policy Framework 2021, which emphasises sustainable development, energy efficiency and reduction in carbon emissions. Strata's proposed sustainability strategy for Barrow Road, Barton upon Humber places great importance on the efficiency of a property's thermal envelope and internal building services whilst enhancing energy efficiency through the use of Photovoltaic panels and Waste Water Heat Recovery, meeting the requirements of North Lincolnshire's Council's Core Strategy Policies relating to Sustainability, Design and Climate Change Mitigation.

Caveat