



PROPOSED RESIDENTIAL DEVELOPMENT

SMITHY BRIDGE ROAD, LITTLEBOROUGH,
ROCHDALE

ENERGY REPORT

Taylor
Wimpey

September 2022

Introduction

This Energy Report has been prepared by Award Energy Consultants on behalf of Taylor Wimpey UK Ltd ("Taylor Wimpey") in relation to a development of 199 dwellings, associated access, drainage, and the provision of public open space and landscaping at Smithy Bridge Road, Littleborough, Rochdale.

This report considers the issues surrounding sustainable construction and, in particular, it considers and evaluates the measures incorporated into the design of the development to reduce the predicted energy usage of the site.

It should be noted that due to the scale of the development, delivery of individual plots will be subject to the Future Homes Standard programme of changes to Part L of the Building Regulations from June 2022. This will result in carbon reductions at least 31% over Part L 2013 along with significantly improved fabric performance.

As the software used to calculate the required metrics is not yet fully functional and should not be relied on for compliance, this Report is founded in Part L1a 2013, though significantly higher carbon reductions will be achieved.

Policy Context

The following documents were considered:

Building Regulations Part L - as new build dwellings, Part L1 is of particular note. Part L1 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

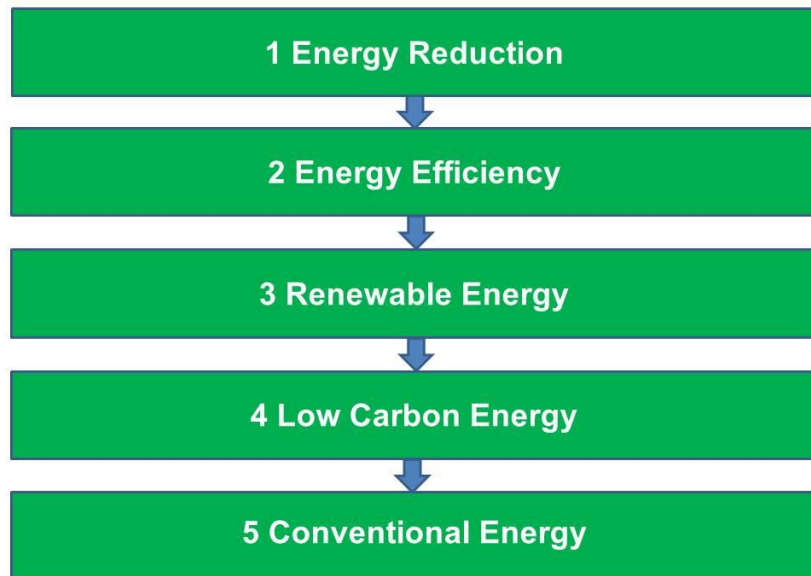
Rochdale Borough Council's Policy G1: Tackling and adapting to climate change encourages high quality design and sustainable construction

Rochdale Borough Council's Policy G2: Energy and new development encourages the use of the Energy Hierarchy to reduce energy demand and carbon emissions

Proposal

Taylor Wimpey have appointed Award Energy to use SAP 2012 to analyse the potential energy efficiencies that can be achieved through an enhanced fabric specification and design, in line with Rochdale Borough Council's Policies G1 and G2. These policies align very closely with the Government's Energy Hierarchy, as shown below.

Energy Hierarchy



Whilst the dwellings at Smithy Bridge Road will be built to the requirements of Part L 2022 and beyond, the software used to calculate these metrics is not yet fully functional and should not be relied on for compliance. Therefore, this Report is founded in Part L1a 2013 with the current Taylor Wimpey specification used to demonstrate the minimum efficiencies proposed. Whilst the detailed future specification for the properties has not been finalised, it is anticipated that each dwelling will benefit from Photovoltaic panels, high levels of insulation, triple glazing and flue gas heat recovery on highly efficient gas boilers at minimum.

Taylor Wimpey considers that the proposed development maximises site characteristics, visual amenity and recognises the surrounding built form, providing a high-quality development. Consideration has been given to the local characteristics of the area, neighbouring properties and the site context and therefore Taylor Wimpey proposes a fabric-first energy demand and carbon emission reduction strategy for the site at Smithy Bridge Lane. This strategy provides an enhanced fabric specification of all dwellings to be built on site which achieves a **4.89%** reduction in fabric energy efficiency and a **3.25%** reduction in carbon emissions over and above the 2013 Building Regulations.

Method

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

Award Energy have compared this specification that will achieve minimum compliance with Part L1a 2013 (i.e. DER=TER) with the intended enhanced Taylor Wimpey specification, as shown in Table 1. Within the enhanced specification, all heat loss elements have been insulated beyond regulation requirements and a 25% target reduction (below regulated U-values) to external walls and floors has been surpassed. In addition, Taylor Wimpey commissioned thermal model results were used and a design air pressure test of 5.01 has also been specified. A highly efficient combi-boiler has also been included with high specification heating controls.

Table 1

Element	Part L1a 2013 Requirements* (u-value)	Taylor Wimpey enhanced specification (u-value)
Walls (w/m ² k)	0.30	0.27
Roofs (w/m ² k)	0.20	0.11
Floors (w/m ² k)	0.25	0.14-0.16
Openings (w/m ² k)	2.0	1.4
Thermal Bridging	ACD	Thermally Modelled
Design air pressure test (m ³ /h/m ²)	10	5.01

* For U-values: See Approved Document L1a 2013 Building Regulations

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 shown in Table 1. Table 2 below shows the predicted Carbon Emissions for the proposed house types.

Table 2

Property Type	Carbon Emissions per plot (KgCO ₂ /m ² /Year) - Baseline specification	Carbon Emissions per plot (KgCO ₂ /m ² /Year) - Enhanced specification	% reduction in Carbon Emissions
Semi-Detached	17.87	17.22	3.64%
Detached	17.72	17.18	3.05%

Table 3 below shows the predicted Carbon Emissions for each house type. The baseline weighted average predicted carbon emissions for the site are 17.77 KgCO₂/Year/m² (with all properties meeting the minimum requirements of Part L1a 2013). The weighted average predicted carbon emissions with Taylor Wimpey's enhanced specification are 17.19 KgCO₂/Year/m² – a **3.25%** reduction in site-wide carbon emissions.

Table 3

Property Type	Number	Weighted Carbon Emissions per plot (KgCO ₂ /m ² /Year) Baseline specification	Weighted Carbon Emissions per plot (KgCO ₂ /m ² /Year) Enhanced specification
Semi-Detached	68	6.11	5.88
Detached	131	11.66	11.31
Total	199	17.77	17.19
Weighted Average Carbon Emissions = 3.25%			

Results of 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 average predicted energy demand for each house type in kWh/m² per year was calculated, as shown in Table 4 below.

Table 4

Property Type	Weighted Fabric Energy Demand (kWh/m ² /yr) Baseline specification TFEE	Weighted Fabric Energy Demand (kWh/m ² /yr) Enhanced specification DFEE	% reduction in Fabric Energy Demand
Semi-Detached	48.53	45.30	6.66%
Detached	54.04	51.84	4.07%

Table 5 below shows the weighted average predicted energy demand for each house type, reflecting the mix on site. The baseline weighted average predicted energy demand for the site is 52.16 kWh/m²/yr (with all properties meeting the minimum requirements of Part L1a 2013). The weighted average predicted energy demand with Taylor Wimpey's enhanced specification is 49.61 kWh/m²/yr – a **4.89%** reduction in site-wide energy requirements over the 2013 Building Regulations.

Table 5

Property Type	No	Weighted Fabric Energy Demand (kWh/m ² /yr) Baseline specification TFEE	Weighted Fabric Energy Demand (kWh/m ² /yr) Enhanced specification DFEE
Semi-Detached	68	16.58	15.48
Detached	131	35.57	34.13
Total	199	52.16	49.61
Site-wide weighted average energy demand reduction = 4.89%			

Not only will the specification deliver the aspirations of the National Planning Policy Framework 2021 but it will also serve to last the lifetime of the development with no future maintenance issues. Fabric first is therefore the most practicable approach to energy demand reduction.

Energy Efficiency Measures

Taylor Wimpey propose to incorporate the following additional measures into the dwellings to reduce carbon emissions and energy demand:

- Highly efficient space and hot water heating systems. These will be accompanied by thermostatic controls, zoned heating and programmers to ensure that heating is optimally controlled to use the least amount of energy
- High levels of insulation across all thermal elements within the build
- Thermal blocks are proposed for this development as they are made of a sustainable material which has a high recycled content and excellent insulation and acoustic absorption properties
- Party Wall u-values to be 0 w/m²k
- High levels of air tightness to be achieved within the construction of the dwelling to reduce unnecessary heat loss. As part of its design and build strategy, Taylor Wimpey is committed to robust monitoring of the standard of construction on site and pre-completion air testing
- Addressing Thermal Bridging limits heat loss across junctions; Taylor Wimpey have looked at the standard details for thermal bridging and, in consultation with the Aircrete Products Association, the Concrete Block Association and the Energy Savings Trust, have modelled and proven enhancements from ACD standard details
- 100% dedicated low energy lighting
- Windows and doors will be a minimum of 30% more efficient than minimum standards with the Building Regulations
- All external light fittings will be provided with energy efficient light bulbs with appropriate control systems for efficient usage
- The benefits of passive solar design are well documented and have been considered by the design team of Taylor Wimpey. Sufficient glazing will be provided to the principal living rooms of each dwelling to ensure sufficient natural lighting, thus reducing the energy consumed in artificially lighting the room. In addition, it is well known that developments which are orientated to ensure that the principal glazed elevations are within 30 degrees of due south are most effective at utilising solar gain, thus reducing energy consumption. Where practicable and feasible this has been incorporated into the site design
- Natural ventilation is the most energy efficient form of ventilating a space. To this end, the dwellings will be naturally ventilated via open-able windows and trickle vents.

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. Taylor Wimpey is 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.

Waste

Taylor Wimpey has national 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.

The re-use and recycling of wooden pallets is encouraged to reduce the amount of wood waste sent to landfill and Taylor Wimpey work closely with suppliers to minimise and recycle packaging.

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.

Pollution

The dwellings will be constructed with insulating materials that have a Global Warming Potential of less than 5.

All dwellings will be heated by highly efficient gas boilers, with those that have NOx emissions of less than 40 mg/kWh being considered.

Health and Wellbeing

In achieving increased levels of energy efficiency, it is important that designers do not lose sight of the fact that they are building homes that people can live in and not just occupy. This is an integral part of sustainability, and a hugely important consideration if the population (and the market place) is to tolerate the sustainability agenda. While it is quite difficult to measure or even quantify health and wellbeing, the following measures are a sample of the efforts made by Taylor Wimpey to address this issue:

- 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.
- All houses will have access to a private garden and garden areas will be fully accessible for disabled occupants, where possible.
- The development has access to local facilities on foot and bicycle.

Conclusion

In accordance with Rochdale Borough Council's sustainability requirements, this Energy Report demonstrates that the enhanced fabric specification of the housing proposed for Smith Bridge Road reduces average energy demand on the site by **4.89%** and average carbon emissions by **3.25%** over the 2013 Building Regulations requirements. The sustainable measures proposed are in line with Rochdale Borough Council's Core Strategy Policies G1 and G2 and the National Planning Policy Framework 2021, which emphasise sustainable development, energy efficiency and reduction in carbon emissions. The energy strategy places a great importance on the efficiency of a property's thermal envelope and internal building service and therefore ensures that each dwelling on the development benefits from built-in energy reduction measures and that the development meets the needs of the present without compromising the ability of future generations to meet their needs.

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.