



PROPOSED RESIDENTIAL DEVELOPMENT AT

**7 Chapel Street, Levenshulme,
Manchester M19 3QB**

ENVIRONMENTAL STANDARDS STATEMENT

Application Number 136792/FU/2023

June 2023



Introduction

This Energy Report has been prepared by Award Energy Consultants in connection with a planning application for a development of 9 new build dwellings at Chapel Street, Levenshulme.

This report considers the issues surrounding sustainable construction with regards to the proposed residential development. In particular, it considers and evaluates the measures incorporated into the design of the development to reduce the predicted energy and water usage of the site as per Manchester City Council's development policies.

Policy Context

The following documents were considered:

Building Regulations Part L1 2021 - as newly constructed dwellings, Part L1 is of particular note. Part L1 sets minimum standards for fabric and energy efficiency for new 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

Manchester City Council's Guide to Development in Manchester Supplementary Planning Document and Planning Guidance Adopted April 2007 - encourages high quality design and sustainable construction and utilising renewable technology to meet 20% of the Energy Demand of the development and a 25% carbon emission reduction over Part L1a 2006

Manchester City Council's Policy EN6 - Target Framework for CO2 reductions from low or zero carbon energy supplies – requires a 15% reduction in carbon emissions over Part L1a 2010 for Target Area 3, which is the designation for the site at Chapel Street. Following The Deregulation Act 2015, the Code For Sustainable Homes is no longer applied at LPA level.

Renewable Technology Analysis

The design team have considered the possibility of utilising various renewable technologies for the development at Chapel Street. 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 5.1 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	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 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	Air Source Heat Pumps can provide low grade heat potential for the buildings, however, are not suitable for schemes such as the development at Chapel Street due to space and noise considerations
Air Source Heat Pump Water Cylinders	Cylinders that use heat pumps to heat water, reducing energy costs and carbon footprint. ASHP water cylinders will be considered for the scheme at Chapel Street
Photovoltaics (PV)	Photovoltaic (PV) technology involves the conversion of the sun's energy into electricity. Due to the benefits gained from this technology, for appropriate plots with suitable roof orientations, PV has been deemed suitable for this development.
Small Scale Hydroelectric	There are no suitable watercourses at or near the development site
Ground Source Heat Pumps	GSHPs are not a suitable technology for large scale developments due to space considerations and marketability

As a result of the above analysis, it is proposed to utilise Air Source Heat Pump Water Cylinders and Photovoltaics panels to meet the Carbon Emission and Primary Energy metrics within Part L 2021.

Reducing Energy Demand and Carbon Emissions

In order to evaluate the proposed sustainability strategy, it is important to determine firstly the base line. This is the level of carbon emissions and energy demand 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. The detailed construction and M&E specifications for the properties has not yet been finalised, however it is anticipated that each dwelling will benefit from Photovoltaic panels, high levels of insulation, high specification glazing and Air Source Heat Pump water cylinders.

Table 1

Element	Part L1 2021 Requirements* (u-value)	Enhanced specification (u-value)
Walls (w/m ² k)	0.26	0.18
Roofs (w/m ² k)	0.16	0.14
Floors (w/m ² k)	0.18	0.12
Windows (w/m ² k)	1.6	1.3
Doors (w/m ² k)	1.6	1.2
Design air pressure test (m ³ /h/m ²)	8	4

* For U-values: See Approved Document L1 2021 Building Regulations

Table 2

House Type	Number	PV Amount Per Plot kWp (approximate)
Semi-Detached	6	2.0
Plots 8 & 9	2	4.0
Detached	1	2.5
Total	9	22.5

Carbon Reduction Calculations

Award Energy have compared the specification that will achieve minimum compliance with Part L1 2021 with the intended enhanced specification as shown in Table 1 and the photovoltaics detailed in Table 2. Table 3 below shows the predicted Carbon Emissions for the proposed house types.

Table 3

House Type	Carbon Emissions (KgCO ₂ /Year/m ²)	Carbon Emissions (KgCO ₂ /Year/m ²)	% reduction in Carbon Emissions	% reduction in Carbon Emissions	% reduction in Carbon Emissions
	Baseline specification	Enhanced specification + PV	over Part L1 2021	over Part L1a 2010	over Part L1a 2006
Semi-Detached	8.95	4.55	49.16%	86.16%	111.16%
Plots 8 & 9	8.34	4.32	48.20%	85.20%	110.20%
Detached	9.07	4.64	48.84%	85.84%	110.84%

Table 4 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 **8.83 KgCO₂/Year/m²**. The predicted average weighted carbon emissions with the proposed enhanced specification, Air Source Heat Pump Water Cylinders and the addition of Photovoltaic panels on the most suitable roofs are **4.51 KgCO₂/Year/m²**. This represents a **48.92%** reduction in site-wide carbon emissions over Part L1 2021, **85.92%** above Part L1a 2010 and **110.92%** above Part L1a 2006, far exceeding the carbon reduction requirements contained in Core Strategy Policy EN6 and the Guide to Development in Manchester Supplementary Planning Document and Planning Guidance.

Table 4

House Type	Number	Weighted Average Carbon Emissions (KgCO ₂ /Year/m ²) Baseline specification	Weighted Average Carbon Emissions (KgCO ₂ /Year/m ²) Enhanced specification + PV
Semi-Detached	6	5.97	3.03
Plots 8 & 9	2	1.85	0.96
Detached	1	1.01	0.52
Total	9	8.83	4.51
Weighted Average Carbon Emission Reduction over Part L1 2021= 48.92%			
Weighted Average Carbon Emission Reduction over Part L1a 2010 = 85.92%			
Weighted Average Carbon Emission Reduction over Part L1a 2006 = 110.92%			

Renewable Technology and Energy Demand

The site-wide energy demand was calculated from SAP10 for each house type, both with the enhanced specification then with the addition of the PV amounts on the most suitable roof spaces as outlined in Table 2.

Table 5

House Type	Energy Demand per House type Enhanced Specification (kWh/Year)	Energy Demand per House type Enhanced specification + PV (kWh/Year)	Reduction in Energy Demand through Photovoltaics
Semi-Detached	8620.32	5917.21	31.36%
Plots 8 & 9	9696.67	7318.96	24.52%
Detached	8620.32	6911.92	19.82%

Once weighted to reflect the house type mix on site (Table 6 below), the Energy Demand with the anticipated enhanced specification is predicted to be 8859.51 kWh per year. Once approximately 22.5 kWp of photovoltaics are applied to the most suitable roofs, the site-wide Energy Demand is predicted to reduce to 6339.23 kWh per year, a **28.45%** energy contribution from renewable technology, exceeding the 20% preference within Manchester City Council's Guide to Development SPD.

Table 6

House Type	Number	Weighted Energy Demand Enhanced Specification (kWh/Year)	Weighted Energy Demand Enhanced specification + PV (kWh/Year)
Semi-Detached	6	5746.88	3944.81
Plots 8 & 9	2	2154.82	1626.44
Detached	1	957.81	767.99
Total	9	8859.51	6339.23
Site-wide Energy Demand Reduction Through Renewables = 28.45%			

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.
- 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
- Highly efficient Air Source Heat Pump Cylinders are proposed, along with photovoltaic panels to generate electricity for use within each dwelling.
- 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
- All houses will have access to a private garden and garden areas will be fully accessible for disabled occupants, where possible.

Material Selection

Sustainable construction material selection is the process of choosing materials that have a low environmental impact throughout their life cycle, from extraction to disposal. This includes considering the materials' embodied energy, recycled content, and toxicity. The development team are dedicated to taking pro-active measures to addressing these issues when working with the principal contractor.

Waste

The proposed development will promote resource efficiency via the effective management and reduction of construction waste. The principal contractor will be encouraged to develop a site-specific Waste Management Plan which will detail the individuals responsible for resource management, the types of waste that will be generated and how the waste will be managed on site (e.g. reduce, reuse, or recycle).

The dwellings will be provided with adequate external space for storing household waste that caters for the widest range of users. Manchester City Council provides refuse and recycling collection services, including garden waste, and external space at the development will accommodate the Council's storage provision.

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 development to obtain the appropriate level of water efficiency. Whilst the exact sanitaryware specification has not yet been decided, the following table has been extracted from the Water Efficiency Calculator using a reasonable anticipated specification, indicating 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)	225	0.11	0.00	24.75
Showers (where bath present)	Flow rate (litres/minute)	8	4.37	0.00	34.96
Kitchen sink tap	Flow rate (litres/minute)	6	0.44	10.36	13.00
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				126.03
Total Internal Water Consumption		126.03			
Normalisation Factor (x 0.91)		114.68			
External Use		5.00			
Part G Water Consumption		119.7			

Conclusion

In accordance with Manchester City Council's sustainability requirements, this Environmental Standards Statement demonstrates that the enhanced fabric and M&E specification of the dwellings proposed for Chapel Street plus the application of approximately 22.5 kWp of photovoltaic panels to the most suitable plots reduces site-wide average carbon emissions by **48.92%** over Part L1 2021, **85.92%** above Part L1a 2010 and **110.92%** above Part L1a 2006, far exceeding the carbon reduction requirements contained in Core Strategy Policy EN6 and the Guide to Development in Manchester Supplementary Planning Document and Planning Guidance. In addition, the application of approximately 22.5 kWp of photovoltaics meets **28.45%** of the predicted site-wide energy demand.

The sustainable measures proposed are in line with Manchester City Council's Core Strategy Policy EN6, the Guide to Development in Manchester SPD and the National Planning Policy Framework 2021, which all 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 before considering bolt-on technology 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

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