



Energy Statement
Windermere Court
PA1422

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1.0 Introduction

This section sets out the approach to the sustainability and energy strategy for the proposed Windermere Court which is a development consisting of 6 new bungalows.

The scheme shall be designed to reduce energy demand through passive design measures lowering energy bills for potential occupiers.

The development will be designed to minimise its environmental impact. We understand that the ongoing running costs represent a considerable proportion of the building's lifecycle cost and the building will be designed to reduce its reliance on grid supplied fuels.

To calculate the energy performance of the building we have produce a SAP model that has been used to predict the buildings energy consumption and carbon emissions in line with national calculation methodology used for Approved Document Part L.

Manchester's Local Development Framework Core Strategy Development Plan Document sets out several requirements for new development.

Policy EN 6

Target Framework for CO2 reductions from low or zero carbon energy supplies Applications for residential development of 10 or more units and all other development over 1,000 sq m will be expected as a minimum to meet the target shown in Tables 12.1 or 12.2, unless this can be shown not to be viable. This should be demonstrated through an energy statement, submitted as part of the Design and Access Statement. Such a statement will be expected to set out the projected regulated energy demand and associated CO2 emissions for all phases of the development.

Table 12.1

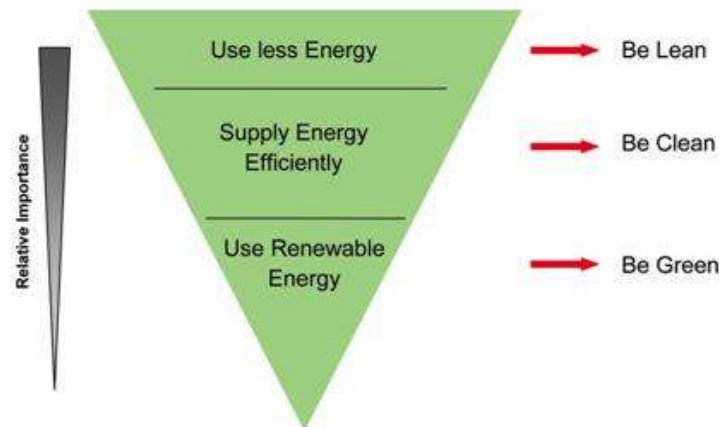
Target	% Minimum requirement
Target 1: Network development area	CHP/district heating anchor or connection or where not feasible a 15% increase on Part L 2010
Target 2: Electricity intense buildings	+15% increase on Part L 2010
Target 3: Micro generation area	+15% increase on Part L 2010

This development has targeted a 15% reduction over Part L 2010 as set out in table 12.1 of Manchester's Local Development Framework Core Strategy Development Plan.

However, the Manchester's Local Development Framework Core Strategy Development goes on to state "Where the CO2 emissions reduction required under any future revision to Part L of the building regulations becomes greater than the '% Minimum requirement', the reduction required under building regulations would apply."

Therefore, this project is targeting a 15% reduction on Part L1a 2013.

The principles will follow the 'Be Lean, Be Clean, Be Green' approach whereby energy consumption is minimised at source through effective thermal performance of building fabric and implementation of the full range of energy saving features such as PIR/daylight linked lighting, active ventilation strategies, high efficiency heat recovery and effective zonal control.



The houses have been modelled with and without the provision of any on site renewable energy technology.

1.2 PassivHaus

All the new dwellings will be highly energy efficient and be constructed to exceed current Building Regulations Standards. The building will be constructed and certified to PassivHaus Classic or PHLEB standard, significantly exceeding Part L Fabric Energy Efficiency Standards ('FEES'). This will be the use of high levels of insulation, an air tight envelope (≤ 1.0 ACH), Mechanical Heat Recovery Ventilation ('MVHR') and triple glazed windows.

Following the PassivHaus quality assurance process is understood to eliminate the performance gap, the difference between predicted carbon emissions and energy efficiency. Space heating demand is understood to be circa 60% higher than predicted in new properties built to Part L 2013.

A scheme built to the above standards can be expected to reduce the buildings regulated CO₂ emissions by between 30 to 40% (refer Stoney Gate Walk, recently completed scheme in Manchester by GWPA and One Manchester).

PART L COMPLIANCE - SAP 2012 & 10.1 (2020)

It is Manchester City Councils intent that all new schemes are to utilise low carbon energy where possible. This means the dwellings at Windermere Close will not use gas combi boilers as might be typically expected. This is because the latest figures for the carbon 'content' of off-grid electricity are now lower than that for gas:

Gas: 2020 - 210g CO₂/kWh

Electricity: 2012 - 519gCO₂/kWh

Electricity: 2020 - 136gCO₂/kWh

From this, it can be seen that any scheme targeting an electric ('low carbon') heating system but using SAP 2012 (as required by Part L 2013) will appear to emit a higher amount of CO₂ than is actually the case. In effect, the policy move against gas at the local level has preceded the necessary changes to regulations and associated compliance software.

To demonstrate compliance for this scheme, we have run calculations for using both SAP2012 and SAP 10.1 (2020) showing that the proposed approach to building fabric performance ('fabric first' approach) delivers an appropriate reduction over a notional dwelling emission rate of a scheme measured under current regulations.

This analysis omits the performance gap associated with scheme that do not follow PassivHaus certification - the difference in final as-built performance for a non-certified dwelling could be expected to be circa 40% higher (total emissions).

2.0 'LEAN' – Design Measures

'Lean' design measures include those which affect the thermal performance of the fabric design. The following has been considered:

- Incorporate solar control treatment where possible on effected elevations
- Include high thermal performing fabrics beyond 2013 Part L limits
- Maximize daylight where possible
- Increased air-tightness of the building
- Consider use of developing technologies where technically and economically feasible

Building Fabric

The target, provisional U-values shown below are beyond the standards of Part L 2013 and will assist in the overall energy savings and carbon emission reductions of the scheme.

Element	U – Value (W/m ² K)
External Wall	0.14
Roof	0.162
Floor	0.13
Windows	0.6 (inc frame) (G-value 0.37)

Air Permeability

The buildings construction should maximise air tightness. An air permeability in order of 1 m³/m²/hr@50pa is recommended. This has assumed that the building will be air tested on practical completion.

1a TER and DER

Fuel for main heating	Electricity	
Fuel factor	1.55 (electricity)	
Target Carbon Dioxide Emission Rate (TER)	29.34	kgCO ₂ /m ²
Dwelling Carbon Dioxide Emission Rate (DER)	29.26	kgCO ₂ /m ²
	-0.08 (-0.3%)	kgCO ₂ /m ²

Pass

These initial design measures have already resulted in an 0.3% improvement on Part L1A2013.

3.0 'CLEAN' – Design Measures

Ventilation

All areas shall be ventilated to ensure compliance with TM59 and mitigate overheating. Mechanical ventilation will be provided with heat recovery to minimise heating energy input. Variable speed fans will also be provided to limit fan power consumption.

Daylighting and Lighting

Daylighting should be optimised to reduce reliance on artificial lighting and luminaires. Toilet, changing, store rooms etc. will be provided with presence detection. 100% Energy efficient lamps and LED lighting will be used throughout the scheme.

4.0 'GREEN' – Renewables / Low Carbon Technologies

At this stage, under Part L1a 2013 PV panels have been proposed for the new development.

1a TER and DER

Fuel for main heating	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	29.34	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	23.66	kgCO ₂ /m ²	
	-5.68 (-19.4%)	kgCO ₂ /m ²	Pass

1b TFEE and DFEE

This has resulted in a further 19.4% reduction from Part L1a 2013, which meet the requirements set out above.

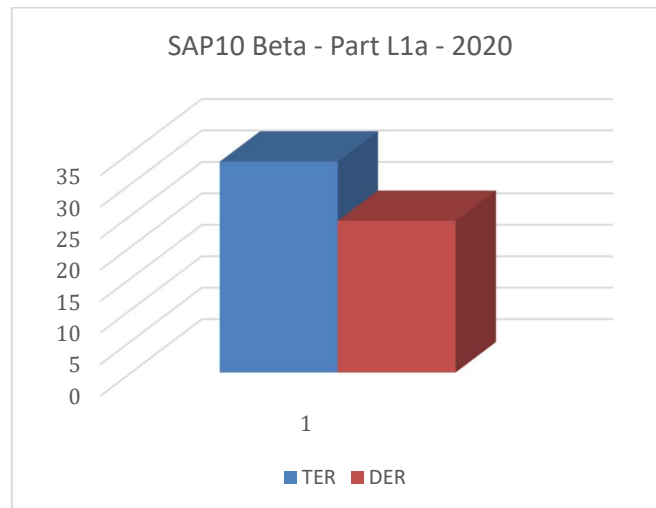
However, adopting the above standards under the proposed Part L1a 2020, renewables are not required to achieve compliance. The input data is detailed below:

SAP10 Beta Software No PV

Data item	Comments and/or assumptions
Walls	0.14 W/m ² k
Floor	0.16 W/m ² k
Roof-loft	0.13 W/m ² k
Roof-slope	NA
Roof-flat	NA
Windows	0.6 (g 0.36)
Roof lights	NA
Doors	1.5 W/m ² k
Air permeability	1
Thermal bridging	ACDs assumed
Fans	N/a
MVHR	Yes to all rooms
Main heating	Electric panel heaters/radiators
Controls	Time & temp control
Hot water	2 bed units as advised 120L cylinder – 2 bed units as advised 120L cylinder
Measured cylinder loss	0.96kWh/day
Permitted by DBSCG	1.89
Secondary heating	None
Lighting	100% low energy lighting LED 100 lumen watts typical with PIR controls to common space - 18W fittings assumed
PV required (kW)	NO PV

With a Showersave system installed see attached for water recovery.

This has resulted in a 28% reduction under the current proposed Part L1a 2020 standard.



5.0 Energy Strategy Summary

The energy strategy for this development is summarised as below and our recommendations include:

- Include high thermal performing fabrics beyond Part L 2013
- Increased air-tightness of the building
- Utilise mechanical ventilation with heat recovery
- LED lighting with automatic controls
- 1.75kWh of PV per dwelling – if under Part L1a 2013 standard

Appendix I – SAP (Front Page Only)**Without PV****SUMMARY FOR INPUT DATA FOR New Build (As Designed)****Criterion 1 – Achieving the TER and TFEE rate****1a TER and DER**

Fuel for main heating	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	29.34	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	29.26	kgCO ₂ /m ²	Pass
	-0.08 (-0.3%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	56.72	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	40.60	kWh/m ² /yr	
	-16.1 (-28.4%)	kWh/m ² /yr	Pass

With PV**SUMMARY FOR INPUT DATA FOR New Build (As Designed)****Criterion 1 – Achieving the TER and TFEE rate****1a TER and DER**

Fuel for main heating	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	29.34	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	23.66	kgCO ₂ /m ²	Pass
	-5.68 (-19.4%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	56.72	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	40.60	kWh/m ² /yr	
	-16.1 (-28.4%)	kWh/m ² /yr	Pass