Energy Statement, Levenshulme Road, Gorton

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Issue	Date	Purpose	Author
A	14.10.22	For Planning	Andrew Keeling

Document History

Approvals

This document requires the following approvals.

Signed approval forms are filed in the Management section of the project files.

Name	Signature	Title	Date of Issue	Version
Ryan Stocks	RS	Director	14.10.22	A

Distribution

Name	Organisation	Role

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1.0 Executive Summary

The purpose of this Energy Statement is to demonstrate that the development site being proposed, Levenshulme Road, Gorton, will meet all local and national requirements in terms of energy provision, building fabric and carbon reduction.

The report will then follow the Energy Hierarchy approach by prioritising fabric efficiency measures prior to the installation of high efficiency building services systems and renewable technologies to enable the maximum viable reductions in CO2 emissions over the Part L 2021 baselines. The overriding objective in the formulation of the strategy is to maximise the reduction in CO_2 emissions through the application of this Hierarchy with a cost-effective and technically appropriate approach that provides maximum benefit to the residents in terms of energy costs.

The new build dwellings are to be assessed under Part L1A (2021) of The Building Regulations (2010). The new build aspects of the site will be required to reduce their CO_2 emissions to meet Part L (2021) compliance. The specific reduction target beyond Part L 2021 for the site, is in line with Policy EN4 to EN6 of the Manchester City Council Core Strategy document to reduce the carbon dioxide emissions of predicted energy use by at least 15% over Part L 2010, a range of energy efficient measures are proposed to provide energy efficient sustainable homes to the future residents.

A range of advanced energy efficiency measures are proposed. They enable the proposed development to meet the Target Fabric Energy Efficiency (TFEE) minimum standards for the residential aspect of the development through energy efficiency measures. In addition, where possible, all non-residential spaces are designed to meet the Part L2A 2021 TER requirements.

The proposed development will seek to use an efficient electric heating system for space heating together with heat pump hot water cylinders and photovoltaic panels to the houses to achieve compliance with L1A 2021.

All properties, both apartment types and houses calculated are an improvement over the target CO2 emissions defined by the Part L 2021 baseline for this development, the results being achieved by following Be Lean, Be Clean and Be Green measures.

2.0 Introduction

This Energy statement is to support the application for the proposals at the development on Levenshulme Road, Gorton. The proposals present a scheme accommodating residential accommodation.

The schedule of accommodation is organised by 6No. two storey houses, 11No. 2Bed apartments and 20No. 1Bed Apartments. A range of apartment sizes will be accommodated with apartments of 1 and 2 bedrooms.

In total, 37 units are proposed.

Zero3 are appointed to draft the Energy Statement for inclusion within the suite of application documents, in particular to comply with policy EN6 of the Manchester City Council Core Strategy document.

This report has been produced in order to provide the methodology by which the design being developed and in particular the energy hierarchy acknowledges and complies with Manchester City Council's requirements.

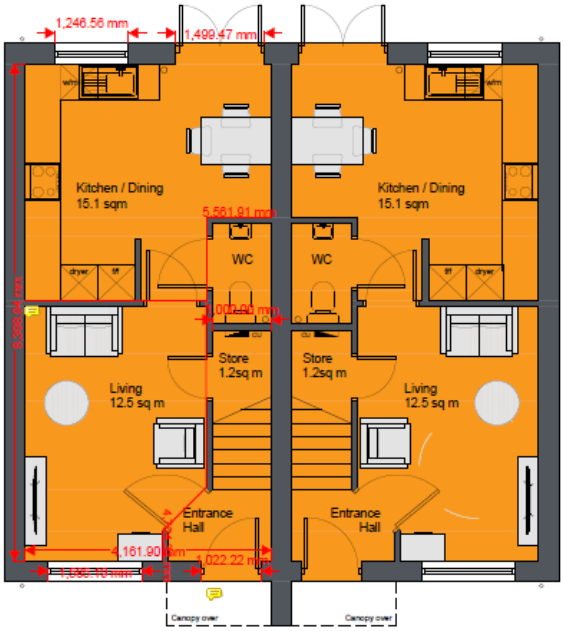
The assessment included in this report is based upon Standard Assessment Procedure SAP 10 and references the associated carbon factors current under Approved Document Part L1 2021.

3.0 The Site

The site is located on Levenshulme Road, Gorton.

4.0 Proposed Development

Proposed Floor Plans (Houses)

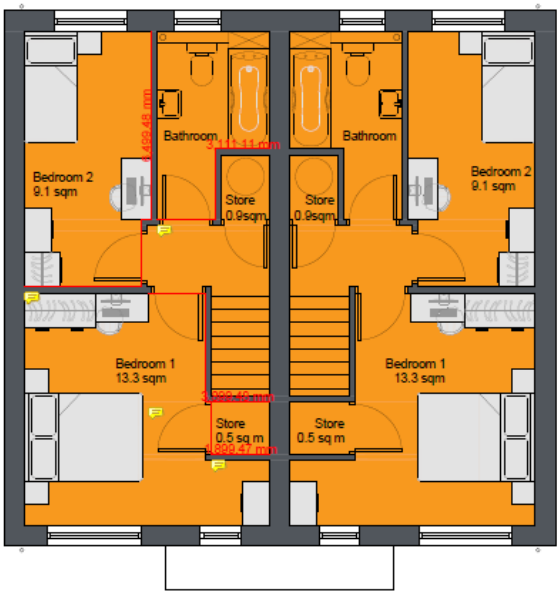


PLOT 1 **PLOT 2**

Ground Floor Plan - 35.0 sqm

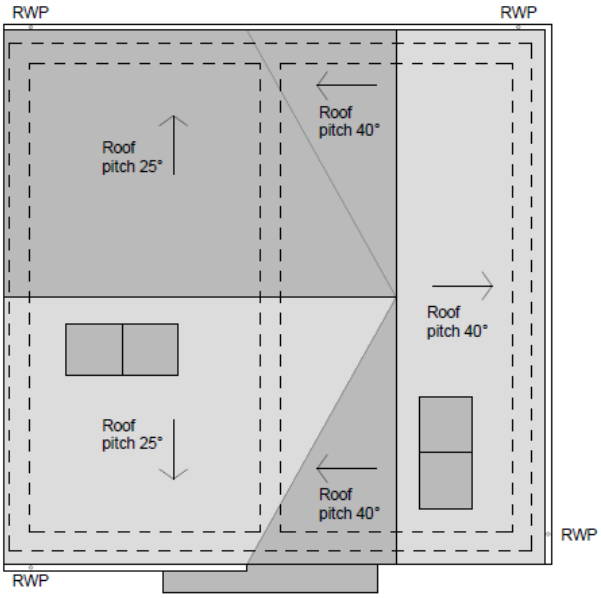
2B 3P House Type
Total 70.0 sqm

01	Proposed Floor Plans (Plots 1-2)
03	Scale 1:50 @ A1



PLOT 1 **PLOT 2**

First Floor Plan - 35.0 sqm



PLOT 1 **PLOT 2**

PLOT 4

PLOT 3

Ground Floor Plan - 35.0 sqm

2B 3P House Type
Total 70.0 sqm

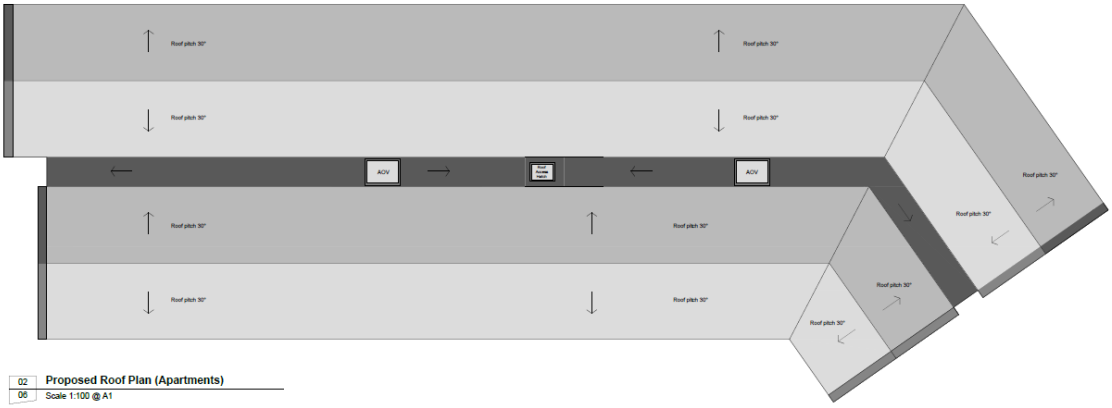
03	**Proposed Floor Plans (Plots 3-4)**
03	Scale 1:50 @ A1

PLOT 3

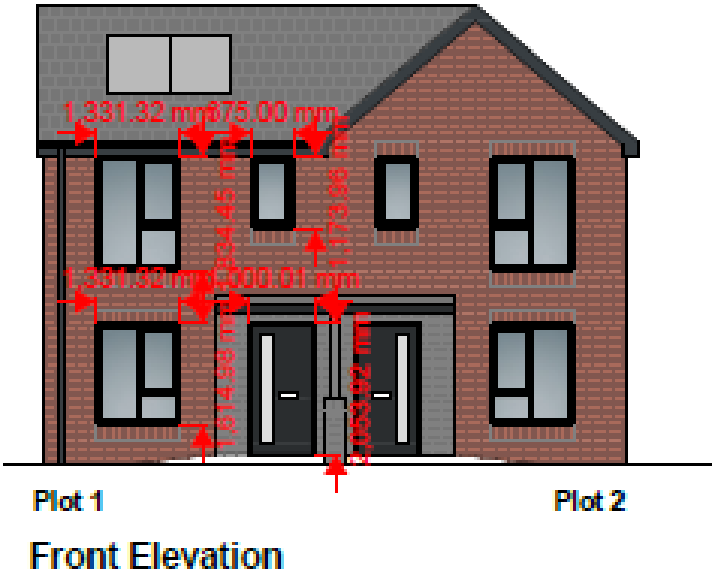
First Floor Plan - 35.0 sqm

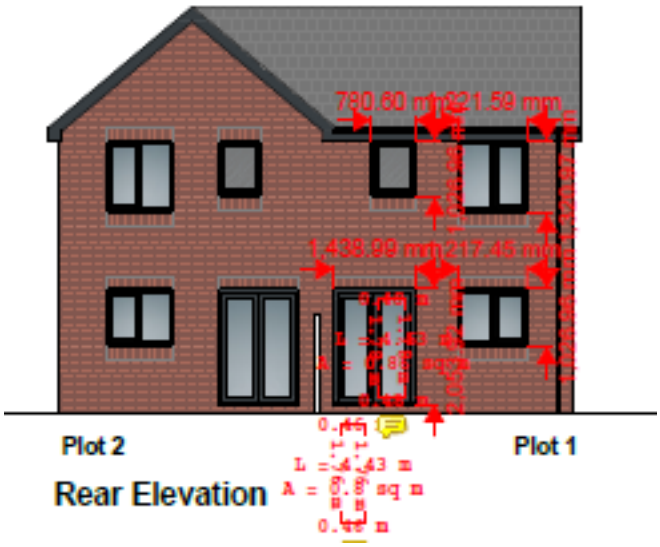
Proposed Floor Plans (Apartments)

01 **Proposed Second Floor Plan (Apartments)**
06 Scale 1:100 @ A1



The breakdown of the apartments is 11No. 2 bedroom apartments and 20No. 1 bedroom apartments.





02 07 **Proposed Elevations (Plots 3-4)**
Scale 1:100 @ A1

01 08 **Proposed Front Elevation (South Elevation)**
Scale 1:100 @ A1

5.0 Policy and Legislation

There are a number of planning policies both national and local that apply to the proposed development.

The UK government has signed up to a legally binding agreement to reduce Carbon emissions by 34% based on 1990 levels before 2020 and by 80% before 2050, this responsibility is being discharged using the Climate Change Act 2008.

The National Planning Policy Framework (NPPF), offers specific guidance which highlights the UK's aspiration to support a transition to a Low Carbon future in a changing climate and in particular, to encourage the use of renewable resources such as Renewable Energy and states;

Planning authorities should ensure that development plans contribute to global sustainability by addressing the causes and effects of climate change through policies which reduce energy use and emissions, promote development of renewable energy resources, and take climate change impacts into account in the location and design of development.

Local Policies

The proposed development is located in Gorton with the local policies adopted by Manchester City Council outlined within the Manchester Local Development Framework Core Strategy Development Plan Document.

Manchester's Local Development Framework

Core Strategy Development Plan Document

Adopted 11th July 2012

Published by Manchester City Council
planningstrategy@manchester.gov.uk

MANCHESTER CITY COUNCIL

Building Regulations Part L1A (2021)

The proposed development is being designed to comply with the Building regulations approved document Part L1A, 2021 edition. This approved document took effect from 15th June 2022.

ONLINE VERSION

HM Government

The Building Regulations 2010

Conservation of fuel and power

APPROVED DOCUMENT

L

Volume 1: Dwellings

Requirement L1: Conservation of fuel and power
Requirement L2: On-site generation of electricity
Regulations: 6, 22, 23, 24, 25, 25A, 25B, 26, 26A, 26C, 27, 27A, 27C, 28, 40, 40A, 43, 44 and 44ZA

2021 edition – for use in England

ONLINE VERSION

Part L1A 2021 reduces the target CO2 emissions by 31% over Part L1A 2013 which in turn aimed to improve energy efficiency standards for new homes by 25% in 2010 and 44% in 2013 relative to 2006 standards.

The notional dwellings used to determine carbon dioxide and fabric energy efficiency targets is the same size and shape as the actual dwelling, constructed to a concurrent specification.

6.0 Energy Assessment

Manchester City Council obligates the applicant to estimate the energy demand of the proposed development together with the dwelling emission rates (DER). This in in line with the core strategy documents in establishing the baseline emissions for the development.

The assessment included is based upon Standard Assessment Procedure SAP 10 and references the associated carbon factors current under Approved Document Part L1 2021.

Whilst the detailed design stage has yet to be commenced, it is possible to make initial estimates of the likely energy usage of the development by producing a notional apartment and house range of SAP calculations across the development using the current plans, general arrangements and elevations for input data and energy figures for the site to meet the current Building regulations Part L1 energy criteria.

Passive Design Improvements

On the completion of the model and establishment of the Target Emission rates (TER), the dwelling emissions have been reduced through judicious passive design. This has involved an assessment of non-energy consuming design decisions to create a fabric first approach to energy efficiency. This is through;

- Improved air permeability performance
- Better thermal Insulation

Passive fabric measures across the building include improvements to the thermal performance and air tightness above Part L requirements of the Building Regulations and this effectively allows the building envelope to attenuate external conditions without recourse to active Building Services.

The table below presents the proposed material specification that will be incorporated within the building design to limit heat losses and ensure efficient operation of the proposed dwellings.

An airtightness of **4m3/hr/m2 @50Pa** is targeted for the development in order to minimise uncontrolled ventilation. An improved air tightness reduces heat losses and energy demand of the dwelling.

Construction Element	Building Regulation Specification	Development Specification	Improvement
Floor - Houses	0.18 W/m²k	0.12 W/m²k	33%
Floor - Apartments	0.18 W/m²k	0.08-0.09 W/m²k	50%
Wall – Houses	0.26 W/m²k	0.18 W/m²k	31%
Wall - Apartments	0.26 W/m²k	0.19 W/m²k	27%
Roof - Houses	0.16 W/m²k	0.09 W/m²k	44%
Roof - Apartments	0.16 W/m²k	0.11 W/m²k	31%
Window – Houses	1.6 W/m²k	1.3 W/m²k Certified	19%
Window - Apartments	1.6 W/m²k	1.4 W/m²k Certified	14%
Doors	1.6 W/m²k	1.2 W/m²k	25%
Air Permeability	8m³/h/m² @50Pa	4m³/h/m² @50Pa	50%

Energy Efficiency Improvements

In addition to the Passive design measures described to improve the building envelope performance, the Active Building Services are to be designed to minimise direct energy consumption and CO_2 emissions, with particular emphasis on the following;

- Improved Hot water efficiencies, **high efficiency heat pump cylinders** for the apartments and houses:
- Reduced Standing Losses from Pipes;
- Increased Hot Water Generating Efficiencies;
- Energy Efficient LED Lighting;
- Improved Lighting Controls;
- Low Energy Motors in Pumps and Fans;
- Improved Heating Controls;

It is currently proposed the dwellings heat energy for Domestic Hot Water to be generated using high efficiency heat pump cylinders.

The ventilation systems will be designed with high efficiency extract fans (System 3), these systems will help reduce the occurrence of moisture and mould.

All internal lighting installations will make use of low energy technologies with 100% low energy lighting.

All fans, motors and pumps shall be specified to incorporate ECA accredited technology and appropriate controls.

Services Element	Specification
Ventilation	System 3 – dMEV Extract to Kitchens and Bathrooms
Lighting	100% Low Energy Fittings
Space Heating	Electric Panel Heaters
Heating Control	Programmer and room thermostats
Water Heating	Heat Pump Cylinder

Renewable Technologies

The potential for renewables and low carbon technologies including solar photovoltaic panels to be incorporated into the proposed development has been considered throughout the design process. The SAP calculations have provided evidence the incorporation of photovoltaics to the houses would prove beneficial in improving the carbon emissions of each dwelling. The current strategy is it provide **1.5kwp** of photovoltaic panels per house.

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Elmhurst Sap 10 SAP 10 program, 1.0

Date: Thu 13 Oct 2022 11:42:09

Project Information			
Assessed By	Ryan Stocks	Building Type	Flat, Mid-terrace
OCDEA Registration	EES/023998	Assessment Date	2022-10-13

Dwelling Details			
Assessment Type	As designed	Total Floor Area	50 m^2
Site Reference	Flat A12 GF (LEV)	Plot Reference	001
Address			

Client Details	
Name	Client
Company	Company
Address	Address, Town, AA11 1AA

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate		
Fuel for main heating system	Electricity	
Target carbon dioxide emission rate	*11.24 $kgCO_2/m^2$*	
Dwelling carbon dioxide emission rate	4.32 $kgCO_2/m^2$	OK
1b Target primary energy rate and dwelling primary energy		
Target primary energy	*59.66 kWh_{PE}/m^2*	
Dwelling primary energy	45.12 kWh_{PE}/m^2	OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	*22.7 kWh/m^2*	
Dwelling fabric energy efficiency	18.9 kWh/m^2	OK

2a Fabric U-values

Element	*Maximum permitted average U-Value [W/m^2K]*	Dwelling average U-Value [W/m^2K]	Element with highest individual U-Value	
External walls	*0.26*	0.19	Walls (1) (0.19)	OK
Party walls	*0.2*	0	Party Wall (1) (0)	**N/A**
Curtain walls	*1.6*	0	N/A	**N/A**
Floors	*0.18*	0.08	Floor (0.08)	OK
Roofs	*0.16*	N/A	N/A	**N/A**
Windows, doors, and roof windows	*1.6*	1.3	Window (1.4)	OK
Rooflights	*2.2*	N/A	N/A	**N/A**

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))

Name	Net area [m^2]	U-Value [W/m^2K]
Exposed wall: Walls (1)	11.106	0.19
Party wall: Party Wall (1)	50.88	0 **(!)**
Ground floor: Floor, Floor	50	0.08 **(!)**

2c Openings (better than typically expected values are flagged with a subsequent (!))

Name	Area [m^2]	Orientation	Frame factor	U-Value [W/m^2K]
Patio door, Patio door	3.087	South West	N/A	1.2
Window, Window	3.087	South West	1.0	1.4

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))

Building part **1 - Main Dwelling**: Thermal bridging calculated from linear thermal transmittances for each junction

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.05	
External wall	E3: Sill	Calculated by person with suitable expertise	0.05	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.05	

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Elmhurst Sap 10 SAP 10 program, 1.0

Date: Thu 13 Oct 2022 11:42:30

Project Information			
Assessed By	Ryan Stocks	Building Type	Flat, Mid-terrace
OCDEA Registration	EES/023998	Assessment Date	2022-10-13

Dwelling Details			
Assessment Type	As designed	Total Floor Area	61 m^2
Site Reference	Flat A14 GF (LEV)	Plot Reference	001
Address			

Client Details	
Name	Client
Company	Company
Address	Address, Town, AA11 1AA

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate		
Fuel for main heating system	Electricity	
Target carbon dioxide emission rate	*12.24 $kgCO_2/m^2$*	
Dwelling carbon dioxide emission rate	5.73 $kgCO_2/m^2$	OK
1b Target primary energy rate and dwelling primary energy		
Target primary energy	*64.59 kWh_{PE}/m^2*	
Dwelling primary energy	59.25 kWh_{PE}/m^2	OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	*33.1 kWh/m^2*	
Dwelling fabric energy efficiency	30.6 kWh/m^2	OK

2a Fabric U-values

Element	*Maximum permitted average U-Value [W/m^2K]*	Dwelling average U-Value [W/m^2K]	Element with highest individual U-Value	
External walls	*0.26*	0.19	Walls (1) (0.19)	OK
Party walls	*0.2*	0	Party Wall (1) (0)	**N/A**
Curtain walls	*1.6*	0	N/A	**N/A**
Floors	*0.18*	0.09	Floor (0.09)	OK
Roofs	*0.16*	N/A	N/A	**N/A**
Windows, doors, and roof windows	*1.6*	1.34	Window (1.4)	OK
Rooflights	*2.2*	N/A	N/A	**N/A**

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))

Name	Net area [m^2]	U-Value [W/m^2K]
Exposed wall: Walls (1)	31.451	0.19
Party wall: Party Wall (1)	33.45	0 **(!)**
Ground floor: Floor, Floor	61	0.09 **(!)**

2c Openings (better than typically expected values are flagged with a subsequent (!))

Name	Area [m^2]	Orientation	Frame factor	U-Value [W/m^2K]
Patio door, Patio door	3.087	North East	N/A	1.2
Window, Window	3.087	North East	1.0	1.4
Window, Window	3.087	North East	1.0	1.4
Window, Window	1.428	North West	1.0	1.4

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))

Building part **1 - Main Dwelling**: Thermal bridging calculated from linear thermal transmittances for each junction

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.05	
External wall	E3: Sill	Calculated by person with suitable expertise	0.05	

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Elmhurst Sap 10 SAP 10 program, 1.0

Date: Thu 13 Oct 2022 11:43:40

Project Information			
Assessed By	Ryan Stocks	Building Type	Flat, Mid-terrace
OCDEA Registration	EES/023998	Assessment Date	2022-10-13

Dwelling Details			
Assessment Type	As designed	Total Floor Area	50 m^2
Site Reference	Flat A15 Top (LEV)	Plot Reference	001
Address			

Client Details	
Name	Client
Company	Company
Address	Address, Town, AA11 1AA

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate		
Fuel for main heating system	Electricity	
Target carbon dioxide emission rate	*11.57 $kgCO_2/m^2$*	
Dwelling carbon dioxide emission rate	5.09 $kgCO_2/m^2$	OK
1b Target primary energy rate and dwelling primary energy		
Target primary energy	*61.42 kWh_{PE}/m^2*	
Dwelling primary energy	52.96 kWh_{PE}/m^2	OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	*23.9 kWh/m^2*	
Dwelling fabric energy efficiency	23.9 kWh/m^2	OK

2a Fabric U-values

Element	*Maximum permitted average U-Value [W/m^2K]*	Dwelling average U-Value [W/m^2K]	Element with highest individual U-Value	
External walls	*0.26*	0.19	Walls (1) (0.19)	OK
Party walls	*0.2*	0	Party Wall (1) (0)	**N/A**
Curtain walls	*1.6*	0	N/A	**N/A**
Floors	*0.18*	N/A	N/A	**N/A**
Roofs	*0.16*	0.11	Roof (1) (0.11)	OK
Windows, doors, and roof windows	*1.6*	1.3	Window (1.4)	OK
Rooflights	*2.2*	N/A	N/A	**N/A**

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))

Name	Net area [m^2]	U-Value [W/m^2K]
Exposed wall: Walls (1)	11.106	0.19
Party wall: Party Wall (1)	50.88	0 **(!)**
Exposed roof: Roof (1)	50	0.11

2c Openings (better than typically expected values are flagged with a subsequent (!))

Name	Area [m^2]	Orientation	Frame factor	U-Value [W/m^2K]
Patio door, Patio door	3.087	North East	N/A	1.2
Window, Window	3.087	North East	1.0	1.4

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))

Building part **1 - Main Dwelling**: Thermal bridging calculated from linear thermal transmittances for each junction

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.05	
External wall	E3: Sill	Calculated by person with suitable expertise	0.05	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.05	

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Elmhurst Sap 10 SAP 10 program, 1.0

Date: Thu 13 Oct 2022 11:44:06

Project Information			
Assessed By	Ryan Stocks	Building Type	Flat, Mid-terrace
OCDEA Registration	EES/023998	Assessment Date	2022-10-13

Dwelling Details			
Assessment Type	As designed	Total Floor Area	61 m^2
Site Reference	Flat A16 Top (LEV)	Plot Reference	001
Address			

Client Details	
Name	Client
Company	Company
Address	Address, Town, AA11 1AA

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate		
Fuel for main heating system	Electricity	
Target carbon dioxide emission rate	*10.76 $kgCO_2/m^2$*	
Dwelling carbon dioxide emission rate	5.08 $kgCO_2/m^2$	OK
1b Target primary energy rate and dwelling primary energy		
Target primary energy	*56.68 kWh_{PE}/m^2*	
Dwelling primary energy	52.78 kWh_{PE}/m^2	OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	*25.4 kWh/m^2*	
Dwelling fabric energy efficiency	25.5 kWh/m^2	FAIL

2a Fabric U-values				
Element	***Maximum permitted average U-Value [W/m^2K]***	**Dwelling average U-Value [W/m^2K]**	**Element with highest individual U-Value**	
External walls	*0.26*	0.19	Walls (1) (0.19)	OK
Party walls	*0.2*	0	Party Wall (1) (0)	**N/A**
Curtain walls	*1.6*	0	N/A	**N/A**
Floors	*0.18*	N/A	N/A	**N/A**
Roofs	*0.16*	0.11	Roof (1) (0.11)	OK
Windows, doors, and roof windows	*1.6*	1.33	Window (1.4)	OK
Rooflights	*2.2*	N/A	N/A	**N/A**

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))		
Name	**Net area [m^2]**	**U-Value [W/m^2K]**
Exposed wall: Walls (1)	11.739	0.19
Party wall: Party Wall (1)	54.57	0 **(!)**
Exposed roof: Roof (1)	61	0.11

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	**Area [m^2]**	**Orientation**	**Frame factor**	**U-Value [W/m^2K]**
Patio door, Patio door	3.087	North East	N/A	1.2
Window, Window	3.087	North East	1.0	1.4
Window, Window	3.087	North East	1.0	1.4

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part **1 - Main Dwelling**: Thermal bridging calculated from linear thermal transmittances for each junction				
Main element	**Junction detail**	**Source**	**Psi value [W/mK]**	**Drawing / reference**
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.05	
External wall	E3: Sill	Calculated by person with suitable expertise	0.05	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.05	

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Elmhurst Sap 10 SAP 10 program, 1.0

Date: Thu 13 Oct 2022 11:44:29

Project Information			
Assessed By	Ryan Stocks	Building Type	Flat, Mid-terrace
OCDEA Registration	EES/023998	Assessment Date	2022-10-13

Dwelling Details			
Assessment Type	As designed	Total Floor Area	50 m^2
Site Reference	Flat B10 Top (LEV)	Plot Reference	001
Address			

Client Details	
Name	Client
Company	Company
Address	Address, Town, AA11 1AA

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate		
Fuel for main heating system	Electricity	
Target carbon dioxide emission rate	*11.58 $kgCO_2/m^2$*	
Dwelling carbon dioxide emission rate	4.79 $kgCO_2/m^2$	OK
1b Target primary energy rate and dwelling primary energy		
Target primary energy	*61.33 kWh_{PE}/m^2*	
Dwelling primary energy	49.83 kWh_{PE}/m^2	OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	*24.0 kWh/m^2*	
Dwelling fabric energy efficiency	22.5 kWh/m^2	OK

2a Fabric U-values				
Element	***Maximum permitted average U-Value [W/m^2K]***	**Dwelling average U-Value [W/m^2K]**	**Element with highest individual U-Value**	
External walls	*0.26*	0.19	Walls (1) (0.19)	OK
Party walls	*0.2*	0	Party Wall (1) (0)	**N/A**
Curtain walls	*1.6*	0	N/A	**N/A**
Floors	*0.18*	N/A	N/A	**N/A**
Roofs	*0.16*	0.11	Roof (1) (0.11)	OK
Windows, doors, and roof windows	*1.6*	1.32	Window (1.4)	OK
Rooflights	*2.2*	N/A	N/A	**N/A**

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))		
Name	**Net area [m^2]**	**U-Value [W/m^2K]**
Exposed wall: Walls (1)	18.078	0.19
Party wall: Party Wall (1)	43	0 **(!)**
Exposed roof: Roof (1)	50	0.11

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	**Area [m^2]**	**Orientation**	**Frame factor**	**U-Value [W/m^2K]**
Patio door, Patio door	3.087	West	N/A	1.2
Window, Window	3.087	South	1.0	1.4
Window, Window	1.428	South	1.0	1.4

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part **1 - Main Dwelling**: Thermal bridging calculated from linear thermal transmittances for each junction				
Main element	**Junction detail**	**Source**	**Psi value [W/mK]**	**Drawing / reference**
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.05	
External wall	E3: Sill	Calculated by person with suitable expertise	0.05	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.05	

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Elmhurst Sap 10 SAP 10 program, 1.0

Date: Thu 13 Oct 2022 11:42:54

Project Information			
Assessed By	Ryan Stocks	Building Type	Flat, Mid-terrace
OCDEA Registration	EES/023998	Assessment Date	2022-10-13

Dwelling Details			
Assessment Type	As designed	Total Floor Area	61 m^2
Site Reference	Flat B12 GF (LEV)	Plot Reference	001
Address			

Client Details	
Name	Client
Company	Company
Address	Address, Town, AA11 1AA

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate		
Fuel for main heating system	Electricity	
Target carbon dioxide emission rate	*11.49 $kgCO_2/m^2$*	
Dwelling carbon dioxide emission rate	5.17 $kgCO_2/m^2$	OK
1b Target primary energy rate and dwelling primary energy		
Target primary energy	*60.52 kWh_{PE}/m^2*	
Dwelling primary energy	53.57 kWh_{PE}/m^2	OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	*29.5 kWh/m^2*	
Dwelling fabric energy efficiency	27.1 kWh/m^2	OK

2a Fabric U-values

Element	*Maximum permitted average U-Value [W/m^2K]*	Dwelling average U-Value [W/m^2K]	Element with highest individual U-Value	
External walls	*0.26*	0.19	Walls (1) (0.19)	OK
Party walls	*0.2*	0	Party Wall (1) (0)	**N/A**
Curtain walls	*1.6*	0	N/A	**N/A**
Floors	*0.18*	0.09	Floor (0.09)	OK
Roofs	*0.16*	N/A	N/A	**N/A**
Windows, doors, and roof windows	*1.6*	1.34	Window (1.4)	OK
Rooflights	*2.2*	N/A	N/A	**N/A**

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))

Name	Net area [m^2]	U-Value [W/m^2K]
Exposed wall: Walls (1)	18.839	0.19
Party wall: Party Wall (1)	29.11	0 **(!)**
Ground floor: Floor, Floor	61	0.09 **(!)**

2c Openings (better than typically expected values are flagged with a subsequent (!))

Name	Area [m^2]	Orientation	Frame factor	U-Value [W/m^2K]
Patio door, Patio door	3.087	East	N/A	1.2
Window, Window	1.68	East	1.0	1.4
Window, Window	3.087	North East	1.0	1.4
Window, Window	3.087	North East	1.0	1.4

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))

Building part **1 - Main Dwelling**: Thermal bridging calculated from linear thermal transmittances for each junction

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.05	
External wall	E3: Sill	Calculated by person with suitable expertise	0.05	

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Elmhurst Sap 10 SAP 10 program, 1.0

Date: Thu 13 Oct 2022 11:43:17

Project Information			
Assessed By	Ryan Stocks	Building Type	Flat, Mid-terrace
OCDEA Registration	EES/023998	Assessment Date	2022-10-13

Dwelling Details			
Assessment Type	As designed	Total Floor Area	50 m^2
Site Reference	Flat B14 Mid (LEV)	Plot Reference	001
Address			

Client Details	
Name	Client
Company	Company
Address	Address, Town, AA11 1AA

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate		
Fuel for main heating system	Electricity	
Target carbon dioxide emission rate	*9.47 $kgCO_2/m^2$*	
Dwelling carbon dioxide emission rate	3.47 $kgCO_2/m^2$	OK
1b Target primary energy rate and dwelling primary energy		
Target primary energy	*50.12 kWh_{PE}/m^2*	
Dwelling primary energy	36.51 kWh_{PE}/m^2	OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	*13.3 kWh/m^2*	
Dwelling fabric energy efficiency	12.9 kWh/m^2	OK

2a Fabric U-values				
Element	***Maximum permitted average U-Value [W/m^2K]***	**Dwelling average U-Value [W/m^2K]**	**Element with highest individual U-Value**	
External walls	*0.26*	0.19	Walls (1) (0.19)	OK
Party walls	*0.2*	0	Party Wall (1) (0)	**N/A**
Curtain walls	*1.6*	0	N/A	**N/A**
Floors	*0.18*	N/A	N/A	**N/A**
Roofs	*0.16*	N/A	N/A	**N/A**
Windows, doors, and roof windows	*1.6*	1.3	Window (1.4)	OK
Rooflights	*2.2*	N/A	N/A	**N/A**

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))		
Name	**Net area [m^2]**	**U-Value [W/m^2K]**
Exposed wall: Walls (1)	11.106	0.19
Party wall: Party Wall (1)	50.88	0 **(!)**

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	**Area [m^2]**	**Orientation**	**Frame factor**	**U-Value [W/m^2K]**
Patio door, Patio door	3.087	South West	N/A	1.2
Window, Window	3.087	South West	1.0	1.4

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part **1 - Main Dwelling**: Thermal bridging calculated from linear thermal transmittances for each junction				
Main element	**Junction detail**	**Source**	**Psi value [W/mK]**	**Drawing / reference**
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.05	
External wall	E3: Sill	Calculated by person with suitable expertise	0.05	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.05	
External wall	E16: Corner (normal)	Calculated by person with suitable expertise	0.09	

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Elmhurst Sap 10 SAP 10 program, 1.0

Date: Thu 13 Oct 2022 11:41:12

Project Information			
Assessed By	Ryan Stocks	Building Type	House, Semi-detached
OCDEA Registration	EES/023998	Assessment Date	2022-10-13

Dwelling Details			
Assessment Type	As designed	Total Floor Area	70 m^2
Site Reference	Plot 1 (LEV)	Plot Reference	001
Address			

Client Details	
Name	Client
Company	Company
Address	Address, Town, AA11 1AA

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate		
Fuel for main heating system	Electricity	
Target carbon dioxide emission rate	*11.51 $kgCO_2/m^2$*	
Dwelling carbon dioxide emission rate	4.38 $kgCO_2/m^2$	OK
1b Target primary energy rate and dwelling primary energy		
Target primary energy	*60.21 kWh_{PE}/m^2*	
Dwelling primary energy	49.93 kWh_{PE}/m^2	OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	*37.5 kWh/m^2*	
Dwelling fabric energy efficiency	36.6 kWh/m^2	OK

2a Fabric U-values

Element	*Maximum permitted average U-Value [W/m^2K]*	Dwelling average U-Value [W/m^2K]	Element with highest individual U-Value	
External walls	*0.26*	0.18	Walls (1) (0.18)	OK
Party walls	*0.2*	0	Party Wall (1) (0)	**N/A**
Curtain walls	*1.6*	0	N/A	**N/A**
Floors	*0.18*	0.12	Floor (0.12)	OK
Roofs	*0.16*	0.09	Roof (1) (0.09)	OK
Windows, doors, and roof windows	*1.6*	1.31	Patio door (1.4)	OK
Rooflights	*2.2*	N/A	N/A	**N/A**

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))

Name	Net area [m^2]	U-Value [W/m^2K]
Exposed wall: Walls (1)	69.9348	0.18
Party wall: Party Wall (1)	42.25	0 **(!)**
Ground floor: Floor, Floor	35	0.12
Exposed roof: Roof (1)	35	0.09 **(!)**

2c Openings (better than typically expected values are flagged with a subsequent (!))

Name	Area [m^2]	Orientation	Frame factor	U-Value [W/m^2K]
Door, Door	2.1	West	N/A	1.2
Window, Window	2.4339	West	1.0	1.3
Window, Window	0.7956	West	1.0	1.3
Window, Window	2.1413	West	1.0	1.3
Window, Window	0.8034	East	1.0	1.3
Window, Window	1.6104	East	1.0	1.3
Window, Window	1.2566	East	1.0	1.3
Patio door, Patio door	3.024	East	N/A	1.4

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))

Building part **1 - Main Dwelling**: Thermal bridging calculated from linear thermal transmittances for each junction

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Elmhurst Sap 10 SAP 10 program, 1.0

Date: Thu 13 Oct 2022 11:41:48

Project Information			
Assessed By	Ryan Stocks	Building Type	House, Semi-detached
OCDEA Registration	EES/023998	Assessment Date	2022-10-13

Dwelling Details			
Assessment Type	As designed	Total Floor Area	70 m^2
Site Reference	Plot 4 (LEV)	Plot Reference	001
Address			

Client Details	
Name	Client
Company	Company
Address	Address, Town, AA11 1AA

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate		
Fuel for main heating system	Electricity	
Target carbon dioxide emission rate	*12.38 $kgCO_2/m^2$*	
Dwelling carbon dioxide emission rate	4.55 $kgCO_2/m^2$	OK
1b Target primary energy rate and dwelling primary energy		
Target primary energy	*64.81 kWh_{PE}/m^2*	
Dwelling primary energy	52.4 kWh_{PE}/m^2	OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency		
Target fabric energy efficiency	*41.6 kWh/m^2*	
Dwelling fabric energy efficiency	41.4 kWh/m^2	OK

2a Fabric U-values

Element	*Maximum permitted average U-Value [W/m^2K]*	Dwelling average U-Value [W/m^2K]	Element with highest individual U-Value	
External walls	*0.26*	0.18	Walls (1) (0.18)	OK
Party walls	*0.2*	0	Party Wall (1) (0)	**N/A**
Curtain walls	*1.6*	0	N/A	**N/A**
Floors	*0.18*	0.12	Floor (0.12)	OK
Roofs	*0.16*	0.09	Roof (1) (0.09)	OK
Windows, doors, and roof windows	*1.6*	1.27	Window (1.3)	OK
Rooflights	*2.2*	N/A	N/A	**N/A**

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))

Name	Net area [m^2]	U-Value [W/m^2K]
Exposed wall: Walls (1)	84.3898	0.18
Party wall: Party Wall (1)	20.92	0 **(!)**
Ground floor: Floor, Floor	35	0.12
Exposed roof: Roof (1)	35	0.09 **(!)**

2c Openings (better than typically expected values are flagged with a subsequent (!))

Name	Area [m^2]	Orientation	Frame factor	U-Value [W/m^2K]
Door, Door	2.1	South West	N/A	1.2
Window, Window	2.4339	South West	1.0	1.3
Window, Window	2.4339	South West	1.0	1.3
Window, Window	0.7956	South West	1.0	1.3
Window, Window	2.1413	South West	1.0	1.3
Window, Window	2.1413	South West	1.0	1.3
Window, Window	0.8034	North East	1.0	1.3
Window, Window	0.8034	North East	1.0	1.3
Window, Window	1.6104	North East	1.0	1.3
Window, Window	0.8034	North East	1.0	1.3
Window, Window	1.2566	North East	1.0	1.3
Patio door, Patio door	3.717	North East	N/A	1.2

Total Carbon Emissions for Development	**9,158 kg/CO2/annum**

Energy Demand	**49,335 kwh/annum**

The anticipated carbon emissions for the development is **9158 kg/CO2/annum**, calculated using SAP10 software.

The total energy demand of the development at this stage has also been calculated to be **49,335 kwh/annum.**

Part L1A 2021 reduces the target CO2 emissions by 31% over Part L1A 2013 which in turn aimed to improve energy efficiency standards for new homes by 25% in 2010 and 44% in 2013 relative to 2006 standards.

Therefore, in complying with the latest building regulations and utilising the latest SAP 10 software, the carbon emissions of the development are a minimum 31% better than the baseline emission requirements as set out within the 2010 standards.

Hence, the CO2 reduction due to utilising the energy hierarchy on this development is in line with latest national and local standards.

6.0 Conclusions

This energy statement has summarised the energy hierarchy requirements for the Levenshulme Road development to respond to the Manchester Council Core Strategy document and Policies.

The development will incorporate passive energy techniques available in the construction industry to reduce its ongoing requirement to consume energy to heat, ventilate and light the building, this is achieved by improved efficient fabric design in excess of the thermal properties set out within the Building Regulations.

The development will incorporate energy efficiency measures in its Building Services to reduce the carbon footprint of the site below the passive improvement stage, using highly efficient hot water generation plant, energy efficient and highly controllable lighting.

The house types will incorporate renewable technology in the form of photovoltaic panels per dwelling. There are a range of sustainable technology options that could feasibly be considered for this project however due to the site's location and particularly the development's type as residential use, when considering energy distribution and metering arrangement, there are significant drawbacks with some of the available options which make realising the maximum benefit of some of these technologies prohibitive although with ambitious aspirations the options should not be dismissed as implausible.

Overall, the Carbon emissions from the proposed development show compliance and improvements with the baseline set by current Building Regulations Part L 2021.

Total Carbon Emissions for Development	**9,158 kg/CO2/annum**

The strategy improves on the fundamental principles of the Building Regulations, and will make a significant contribution to reducing the annual CO_2 emissions of the development.

The method of demonstrating that the design incorporates energy efficiency measures and meets the planning aspiration for energy requirements to be met are below:

The design has applied passive principles and incorporates a 'fabric-first' approach to achieve a highly-efficient thermal envelope and reduce primary energy requirements to the point that anecdotal evidence would suggest that heating energy demands are actually below that projected by the software calculations resulting in a reduction in actual operational energy use compared to the desktop assessments.

The application of passive principles to maximise thermal efficiency is a valid and cost-effective proposal. The upgrades to the fabric will offer a significant improvement over and above the limiting factors set out with Approved document L1A as shown within this report.

Water-efficient fittings (e.g. aerated shower heads and taps) will help to reduce loads for water heating.

Electrical demand for lighting will be minimised using energy efficient lighting throughout all areas.

The hot water cylinder provided will be a heat pump cylinder and will be insulated with low standing losses.

Photovoltaic panels will be provided to all house types.

Fittings will be specified to give a reasonable balance between low water consumption, performance and cost. This will allow the fixtures selected to have a proven track record of reliability, provide performance in line with the expectation of the occupants and to meet architectural aesthetic aspirations.

The design is currently progressing based on achieving a consumption of <110 l/p/d as required by Part G of the Building Regulations.