

**Environmental Standards & Energy
Statement Ref: Z43286 to Support
Discharge of Planning App
122945/FO/2019 Condition 14**

96No. New Build Dwellings

at

**328-336 Stockport Road,
Longsight, Manchester M13**

for

Rowlinson Constructions Ltd.



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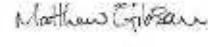
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1. Introduction

The proposed development consists of 96No. new-build apartments located at Stockport Road, Longsight. The development is required to achieve compliance under Building Regulations Approved Document Part L1 and the approved planning 122945/FO/2019 condition 14. The planning condition 14 pertaining to the site is as follows:

"The development hereby approved shall be carried out in accordance with the Environmental Standards and energy statement prepared by Element Sustainability stamped as received by the City Council, as Local Planning Authority, on the 8 March 2019. A post construction review certificate/statement shall be submitted for approval, within a timescale that has been previously agreed in writing, to the City Council as Local Planning Authority.

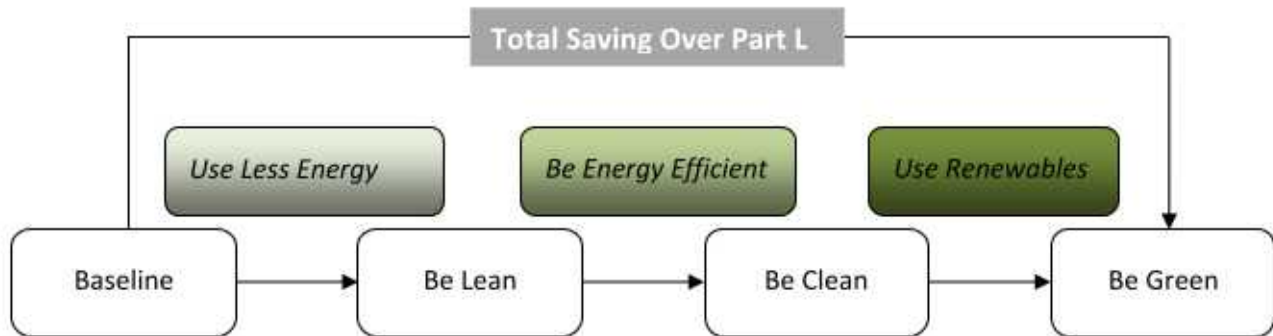
Reason - In order to minimise the environmental impact of the development pursuant to policies SP1, T1-T3, EN4-EN7 and DM1 of the Core Strategy and the principles contained within The Guide to Development in Manchester SPD (2007) and the National Planning Policy Framework."

Supporting information is provided within this report for the as built energy strategy in accordance with the following planning policies that were applicable at the time of the planning submission:

- Manchester City Council Local Plan
- Manchester City Council Local Application Requirements
- National Planning Policy Framework
- Planning Condition 14

Throughout this report, passive design techniques, energy efficient equipment and appropriate low carbon technologies will be appraised in line with the 'Be Lean, Be Clean, Be Green' philosophy of relevant planning documents and the Energy Hierarchy.

The development has been provided with energy savings through the use of passive improvement measures such as improved energy efficiency. In line with the energy hierarchy illustrated below, the development complies with ADL1A 2013 through fabric efficiency measures alone, before the application of low and zero carbon technologies (PV). The development is serviced by electric panel heaters for space heating, hot water immersion cylinder and efficient mechanical ventilation with heat recovery. Finally, PV panels have been included to meet the relevant criteria.



The principles of a Be Lean, Be Clean, Be Green design philosophy have been applied, which results in a 54% improvement over Building Regulations Part L1, as indicated in **Error! Reference source not found.** A full design specification that confirms inputs used within the SAP calculations is provided within the Appendices of this report.

2. Methodology

This energy strategy assessment has undertaken the as built SAP calcs. The baseline energy assessment consists of calculating the total CO₂ emissions of the development to meet Building Regulations and then compare the actual development against this baseline.

The building can then be benchmarked/thermally modelled using the energy hierarchy:

1. Be Lean <i>A reduction in energy use as a result of passive design and energy efficiency</i>
Thermal performance of envelope (U-values) Glazing design Airtight construction Efficient mechanical ventilation Variable speed fans and pumps Energy Efficient lighting
2. Be Clean <i>A focus on supplying energy to the development through efficient means</i>
Connect to low carbon heat networks Develop site wide heat network from single energy centre On site CHP Provide energy efficient individual electric heating
3. Be Green <i>The installation of renewable technologies to meet energy demand where possible</i>
Consider the feasibility of renewable energy technologies Assess the integration of renewable technologies based on the above measures

The development has been provided with energy savings through the use of thermal improvements to fabric (a 'fabric first' approach), followed by other clean energy solutions (energy efficiency improvements, etc.) and finally the use of renewable energy technologies (PV). This hierarchy complements the integrated approach to the sustainable energy objectives.

The planning policies required a full review of the technical and economic feasibility of the renewable technologies: and photovoltaic panels have been included to support the CO2 emission reduction and associated running costs

The approach of the development has been to embed sustainability into the heart of the design from the outset of the project design process. The design will be developed with sustainable solutions, taking into account the relevant policies and strategies of Part L and Manchester City Council Local Plan.

2.1. Passive Design Measures

The philosophy for the site is to achieve as much of the necessary reduction in carbon emissions through the use of passive design techniques and energy efficient measures as possible, before resorting to the use of LZCs. This ensures that the highest standards of building fabric and energy efficiency are achieved.

This will be undertaken through a fabric first energy efficient design approach with high levels of thermal efficiency and a reduction in energy demand through efficient lighting design.

2.2. Energy Efficient Systems

Options have been reviewed for improving the energy efficiency of the development by installing an efficient mechanical ventilation with heat recovery system.

Dwellings will also be provided with a metering scheme based on their electricity usage.

3. Renewable Energy Technologies

The design team reviewed options for the use of on-site renewable energy/Low or Zero Carbon Technology (LZT) in line with the client aspirations and the Manchester City Council Local Plan. Photovoltaic panels were installed on the development and the key benefits of this are detailed below.

3.1. Photovoltaics (PV)

Photovoltaic panels convert sunlight into electricity to run lights and appliances. Photovoltaic panels use cells to convert light into electricity. A PV cell normally consists of 1 or 2 layers of a semi conducting material such as silicon. When light shines on a cell it generates energy causing electricity to flow, the higher the light intensity is, the more electricity flows.

The amount of energy PV cells generate is referred to as Kilowatt Peak (kWp). PV arrays now come in a variety of shapes and colours, ranging from grey 'solar tiles' that look like roof

tiles to panels and transparent cells that you can use on conservatories and glass to provide shading as well as generating electricity. Solar panels are not light and the roof must be strong enough to take their weight, especially if the panel is placed on top of existing tiles. For flat roofs the panels can be mounted on A-frames to give the optimum angle.

The optimum panel inclination for solar collection is 35°, oriented due south; however panels that are inclined between 35° and 45° and oriented south of west or east are generally suitable. If solar collectors are oriented away from due south then a larger surface area will be required to generate a set amount of energy. The effect of non-optimal orientation is illustrated by the graph to the right:

The cost to install PV is typically £1,000 - £1,500 per kWp for 'on-roof' panel systems.

The roof supports the addition of photo-voltaic panels and this is the most suitable renewable technology option. An array totalling 27kWp has been installed to assist with compliance against the local planning policy.

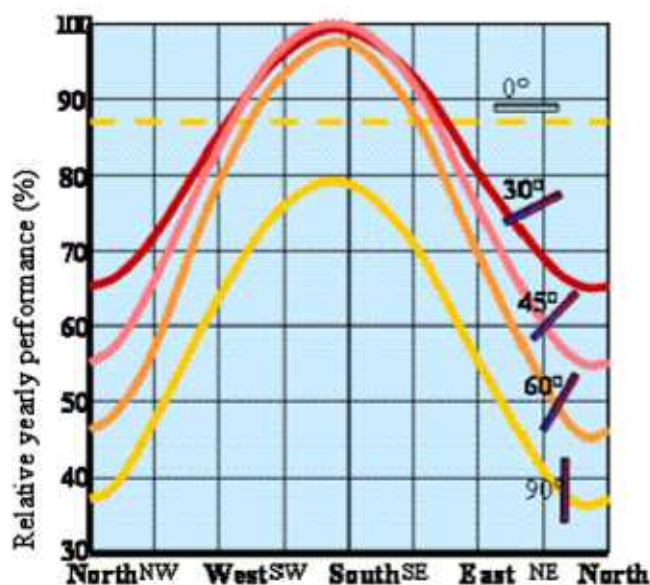


Figure 1- Performance of photovoltaic panel orientation

4. Conclusion

Following the 'Be Lean, Be Clean, Be Green' hierarchy, the as built building reduces the total carbon emissions by 68,200 Kg/CO₂/yr from the baseline emissions of 127,400 kg/CO₂/yr. This equates to a 54% carbon reduction from the calculated baseline regulated energy emissions of ADL1.

The results contained herein confirm that Planning condition 14 has been achieved. The results of the SAP block compliance are also included in Table 2 below, which confirm the 54% uplift on building regulations criteria is met. The majority of the flats achieve an EPC 'B' rating.

The approach for the as built residential development was to embed sustainability into the heart of the development through a range of design measures based on the 'Be Lean, Be Clean, Be Green' design hierarchy. Measures included:

- 1) Enhanced building fabric to meet Building Regulation ADL1
- 2) Enhanced air tightness (3.5m³/m²/hr average) and thermal bridging
- 3) Efficient mechanical ventilation with heat recovery in each apartment
- 4) Heating provided a highly efficient direct electric heating
- 5) Hot water provided from a cylinder with immersion heater
- 6) Efficient lighting strategy primarily using CFL or LED type fittings
- 7) Photovoltaic rooftop panel array totalling 27kWp

4.1. Low/ Zero Carbon Technologies (LZT) Review

- 27kWp Photovoltaic panels have been installed for the development, which are supplied into the communal landlord areas to assist with reducing the standing charges.

4.2. Summary Headlines

- A passive fabric-first approach has been taken to reduce the energy demand of the proposed residential development before the application of low and zero carbon technologies.
- 89No. of the total 96No. dwellings have been air leakage tested and the results measured are consistent. The average air leakage rate measured across all the plots is 3.5m³/m²/hr, which is a very good standard of air tightness which exceeds building regulation targets.
- An efficient mechanical ventilation with heat recovery system and an 27kWp rooftop photovoltaic array has been installed, which provides significant improvement above ADL1A 2021.
- An overall 54% improvement in CO₂ emissions above the ADL1 baseline is achieved and meets policy requirements.

Table 1 - Summary of Carbon Emissions

	Regulated CO2 Emissions (KgCO ₂ /Yr)
	Total
Baseline Regulated Emissions of Development (TER)	127,400
Be Lean, Be Clean & Be Green As Built Performance	59,200
Total Reduction in Energy (KgCO₂/yr)	68,200
Percentage Improvement in TER Carbon Emissions	54%

SAP 10.0 Performance

Table 1: Carbon Dioxide Emissions after each stage of the Energy Hierarchy for domestic buildings

	Carbon Dioxide Emissions for domestic buildings (Tonnes CO ₂ per annum)	
	Regulated	Unregulated
Baseline: Part L 2013 of the Building Regulations Compliant Development	127.4	
After energy demand reduction (be lean)	67.5	
After heat network connection (be clean)	67.5	
After renewable energy (be green)	59.2	

Table 2: Regulated Carbon Dioxide savings from each stage of the Energy Hierarchy for domestic buildings

	Regulated domestic carbon dioxide savings	
	(Tonnes CO ₂ per annum)	(%)
Be lean: Savings from energy demand reduction	59.9	47%
Be clean: Savings from heat network	0.0	0%
Be green: Savings from renewable energy	8.3	7%
Cumulative on site savings	68.2	54%
Annual savings from off-set payment	59.2	-

4.3. As Built Specification for Energy Assessments (SAP)



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Appendix IE – As Built Stage

To meet Part L1A 2013

Energy Evaluation Ref: Z43286

96No. Apartments @ Longsight Road, Stockport

Thermal Fabric & M&E Specification

Item	Brief description	Notes	Confirm
	The following information is required for the design submission (as per requirements of approved doc L1A).	Please note submission is now in two stages. A) Design. B) As installed	
1. Dwelling & Compliance Details			
1.1	Building Regulations Part L1A 2013 apply.		
1.2	Electricity is supplied by standard tariff rather than economy 7, 10 or 24.	Assumed Standard tariff	
1.3	SFS system Dwellings have a low thermal mass parameter.	Lightweight Construction	
1.4	Plot numbers for the apartments have been assumed	Provided M13 0LE or M13 0BR	
1.5	The conditioned Planning statement requires 10% improvement on ADL1A compliance	Above Building Regs Standard. EC reviewing against GLA SAP 10	
2. Floor Construction Details			
2.1	Ground floor is 65mm screed, beam and block floor 110-120mm PIR achieving the U-value stated opposite	U-Value range= 0.14 W/m ² K P/A ratio IKO Enertherm PIR. Conductivity= 0.022 W/Mk. EC U-value calcs.	
2.2	Upper heat loss floors – apartments above unheated space (plantrooms or S&C commercial space etc) are 150mm reinforced concrete with a total of 195mm rockwool insulation to achieve U value opposite	U-Value = 0.18 W/m ² K U-Value calc provided	
3. Wall Construction Details			
3.1	Main external wall is SFS with Brick outer leaf construction and is insulated to achieve the U value indicated opposite.	U-Value = 0.19 W/m ² K Refer to email dated 26-1-2022 from Mike Bagot of Rowlinson's confirming location of brick and U value to be achieved. As M.Bagot email 26-08-22 WT1 and WT2	
3.2	Main external wall insulated panels insulated to achieve the U value indicated opposite.	U-Value = 0.27 W/m ² K Refer to email dated 26-1-2022 from Mike Bagot of Rowlinson's confirming location of insulated Panels and U value to be achieved. As M.Bagot email 26-08-22 WT5	
3.3	Main external wall metal panels insulated to achieve the U value indicated opposite.	U-Value = 0.22 W/m ² K Refer to email dated 26-1-2022 from Mike Bagot of Rowlinson's confirming location of insulated Panels and U value to be achieved. As M.Bagot email 26-08-22 WT3 and WT4	
3.4	Walls to unheated spaces are insulated to achieve the U-value indicated opposite. (plantrooms/bin stores/ stairwells to apartment etc)	U-Value = 0.18 W/m ² K <i>Please provide U value calc</i>	
3.5	Party walls between apartments and from apartment to other heated areas (circulation/ corridors etc) space are fully filled, cavity sealed as U-value opp	U-Value = 0.0 W/m ² K Refer to ACDs which confirm fully filled.	
3.6	Corridors and other Communal space are heated to 18C; therefore, no semi exposed walls are present to apartments	As M.Bagot email 26-08-22 confirming	
3.7	Stairwells to be unheated		
3.8	Walls to lifts and M&E risers are internal to the fabric of the building and are surrounded by heated space therefore classed as no heat loss		
3.9	Curtain walling is installed on various facades to meet U _{eq} value as set out in evidence	Aire valley windows have averaged all U _{eq} =1.5W/m ² K. Elevation dwgs show positions as email 1/06/22	
4. Roof Construction Details			
4.1	Conventional lofts are insulated to achieve the U value opposite Typically, 400mm MW Quilt or equivalent over townhouses. Roof coloured light grey on roof dwg	U-Value = 0.11 W/m ² K As M.Bagot email 19/04/22	
4.2	Flat roof with tapered insulation to achieve the U value indicated opposite. Roof coloured purple and red	U-Value = 0.10 W/m ² K as Kingspan calc and M.Bagot email 19/04/22	
4.3	Flat roof as highlighted dark grey within evidence to achieve the U value indicated opposite.	U-Value = 0.13W/m ² K As M.Bagot email 19/04/22	
4.4	Flat roof as highlighted yellow within evidence to achieve the U value indicated opposite.	U-Value = 0.16W/m ² K As M.Bagot email 19/04/22	
5. Openings			
5.1	Doors to apartments are not included in the calculation as the corridors are heated		



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Appendix IE – As Built Stage

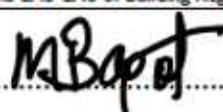
To meet Part L1A 2013

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96No. Apartments @ Longsight Road, Stockport

Thermal Fabric & M&E Specification

5.2	External doors to town house apartments are installed to achieve the U-value opposite.	U-Value = 1.55 W/m ² K average glass and frame U-Value	
5.3	All double-glazed windows and patio type doors/windows with Low-e glass hard coating with argon fill to achieve the U value opposite. Al frame	Aire valley windows have averaged all U _w =1.3W/m ² K. Elevation dwgs show positions as email 1/06/22 G values set out in aire valley info and range from 0.37 (South) to 0.6 (North)	
6. Ventilation & Air Tightness			
6.1	Design stage SAP and SBEM calculations assumes an air permeability of 4m ³ /m ² /hr at 50Pa	All plots to be tested as EC email 24/08/22	
6.2	Mechanical ventilation with heat recovery system 4 in all apartments. No trickle vents required. This will be fitted by an Approved installer.	Domus Ventilation. Lit saved to file. HRXD / LAB 1283- SAP ref: 500513 Townhouses HRXE / LAB 1355R – SAP ref: 500677 – All Flats	
7. Space Heating			
7.1	Heating is provided by electric panel heaters		
7.2	Heating controls – programmer and room stat		
7.3	Corridors and other communal space are to be heated to 18C or more.	SAP conventions	
8. Water Heating			
8.1	Water usage per person per day is ≤125 Litres.		
8.2	Hot water storage is present in the apartments using the Oso Super Sxiq SX120 – 1 bed SX150 – 2 bed SX210 – townhouse	1 Bed = 120 litre cylinder, 1.03 kWh/day 2 bed = 150 litre cylinder, 1.27 kWh/day Town house SX210 – 1.56 kWh/day As M.Bagot email 26-08-22	
9. LZCT/ Renewables			
9.1	PV Panels will be situated on the roof as indicated opposite. All PV is fed into the communal areas and PV is allocated on an average area basis to meet the 27kWp total.	27.335kWp PV As PV layout - 0.2kWp per 89No. Apartment, 1.34kW per 7No. townhouses (allocation) As M.Bagot email 26-08-22 confirms PV layout. 285W per panel confirmed	
10. Lighting			
10.1	Dwellings - 100% Low energy (LE) lights are installed throughout with a min. efficacy of 45 lumens/circuit watt	Building Regs ADL1A standard	
10.2	Non-Dwelling areas – LED lighting is installed with a min. efficacy of 90 lumens/circuit watt and controlled via presence detection PIR in front of house areas	Building Regs ADL2A standard	
10.3	Non-Dwelling areas – Display lighting has a min. efficacy of 60 lumens/circuit watt	Building Regs ADL2A standard	
11. Thermal Bridging			
11.1	Accredited Construction Details (ACD) for limiting thermal bridging are installed at every junction in the main fabric.	Refer to ACD details. As M.Bagot email 26-08-22. Any balconies to have thermal breaks	
11.2	Standard lintels have been included.	Psi value = 0.3	
11.3	No Enhanced construction thermal bridging details have been included.		
12. Other – Non-Dwelling Areas			
12.1	All fans are in accordance with the minimum requirements of 'Non-Domestic Building Services Compliance Guide, 2016' in terms of Specific Fan Power.		
12.2	A Building Log Book will be provided following the guidance in CIBSE TM31, Building Log Book Toolkit.		
12.3	Building Regulations Part L2A 2016 apply. Please confirm that all fixed building services are in accordance with the minimum standards set out in paragraphs 2.45-2.48 of Building Regulations Part L2A 2016		

Signed by  On behalf of Rowlinson Constructions Dated 