



Energy Statement

Client: BM & HP Parker Properties

Project: Land Adjacent Rochdale Road
Blackley, Manchester

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EXCELLENCE
IN ENERGY
ASSESSMENT

Registry of Amendments

Revision	Date	Amendment Details	Prepared by
V.1	30/01/23		B Diala-Uka

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1 EXECUTIVE SUMMARY

This Energy Statement investigates the options for energy efficiency measures and details the proposed solution for the development at 1133 Rochdale Road MDA.

1.1 Methodology and Strategies

The methodology used to determine this development achieves compliance is in accordance with Part L1A '

The table below shows the Energy Hierarchy and suggested strategies for the proposed development.

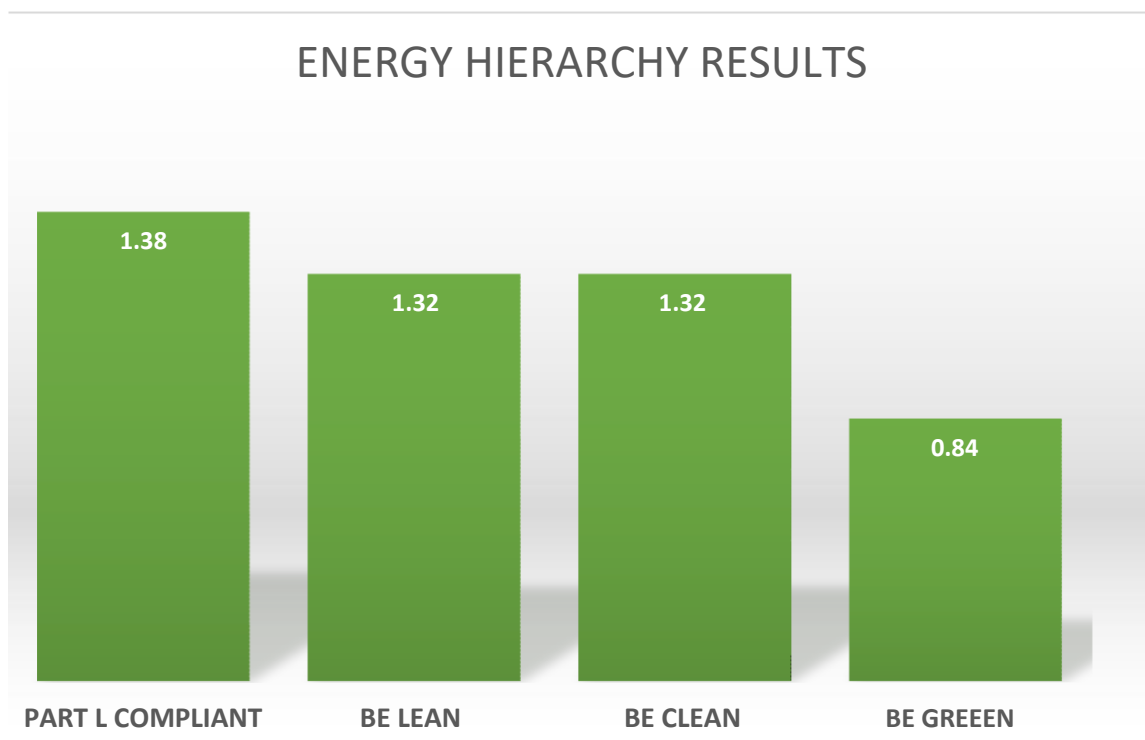
Stages	Strategies
Energy Efficient Design	• Highly insulated thermal envelope significantly improvement on minimum U values for Building Regulations • Improved levels of air tightness • Use of Accredited Construction Details for all thermal bridges • Use of gas fired combi boilers with flue gas heat recovery • Low Energy Lights throughout • Low Water consumption
District Heating / communal heating / CHP	• Existing District heating network not within local vicinity. • The proposed development is considered too small for CHP • The proposed development is considered too small for communal heating

1.2 Assessment Results

After the application of all strategies based on the Energy Hierarchy, the regulated CO² have been reduced as follows:-

Energy Hierarchy	Regulated CO ² Emissions (KgCO ² /yr)	Energy Usage (kWh/yr)	CO2 Reduction %
BASE	1380	5,843	-
BE LEAN	1320	5,584	4.3
BE CLEAN	1320	5,584	4.3
BE GREEN	840	4,641	39.1 34.8 from renewables

The carbon savings from each stage can be calculated based on the above results, The Chart below summarises the total cumulative savings.



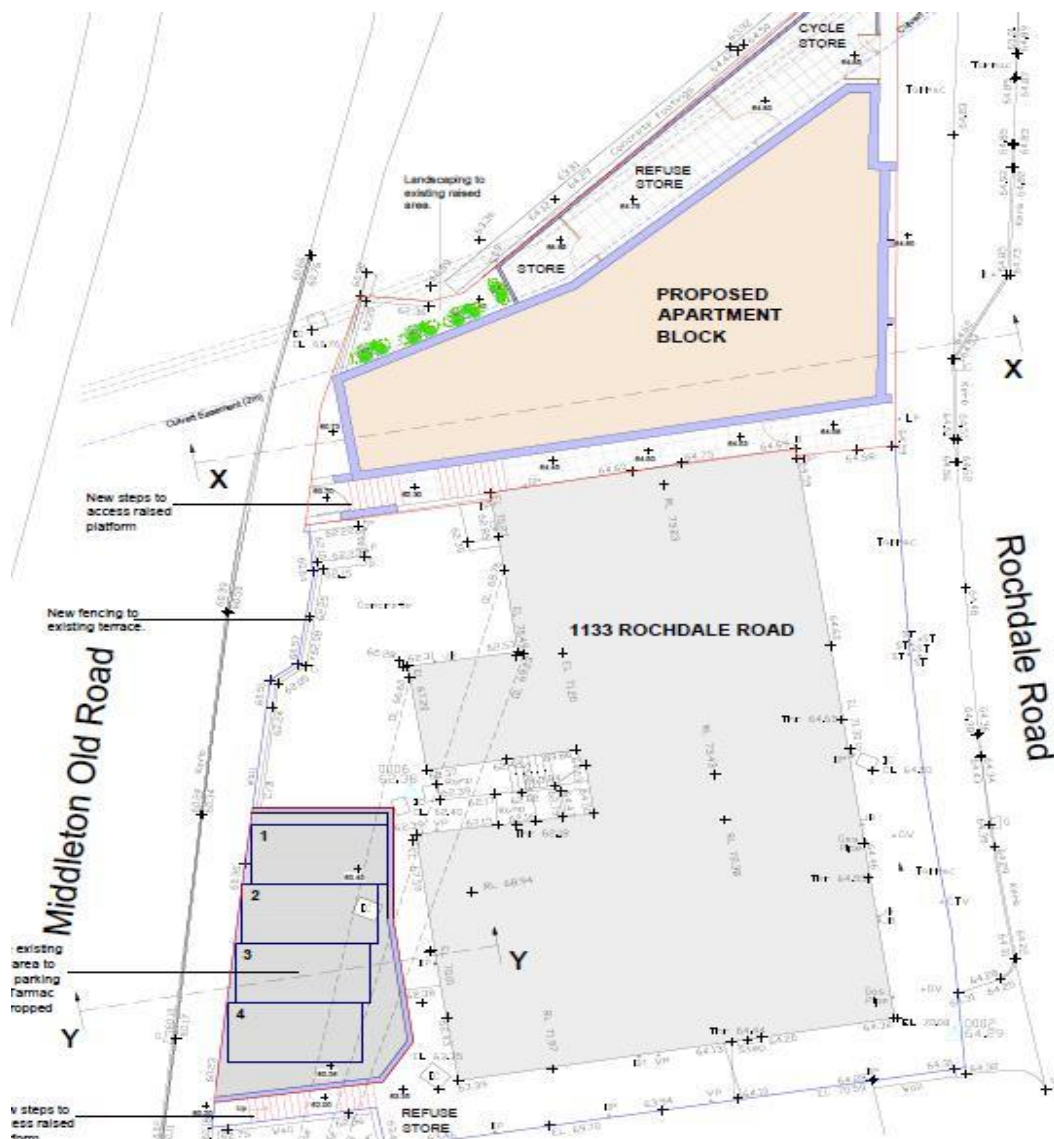
2 INTRODUCTION

- 2.1 Diland EPC Limited has been commissioned by Bobby Diala-Uka to provide an Energy Statement in support of the planning application for the proposed development at 1133 Rochdale Road MDA. The Energy Statement will demonstrate how the development will comply with the CO² emissions and energy related sustainability requirements.
- 2.2 The report outlines the energy strategy for the development in order that it achieves the minimum reduction in Regulated CO² emissions.
- *Be Lean* – Use less energy by improvements to the thermal fabric of the building
 - *Be Clean* – Deliver energy efficiently – De-centralized energy
 - *Be Green* – make use of renewables where applicable
- 2.3 This statement will establish the baseline energy usage and CO² emission for the development. As this is a residential development the calculation has been carried out using the SAP energy calculation model under Building Regulations Part L 2013 to work out the Target Emissions Rate(TER) and Dwelling Emissions Rate (DER) of each proposed flat and averaged out. The statement will then outline measures to reduce the overall energy requirement
- *Be Lean*; identify energy efficient services that can be incorporated into the development
 - *Be Clean*; and finally if required identify suitable renewable energy sources that are suitable for the project and have the capability of achieving the required reductions in CO² emissions
 - *Be Green* – use of low and zero carbon energy sources
 - The report will also identify a possible CO² reduction from renewables.

2 DEVELOPMENT DESCRIPTION

2.1 The proposed development is located on Land Adjacent to 1133 Rochdale Road MDA.

2.2 The proposed development of 1 semi-detached house



3 WATER EFFICIENCY

In accordance with the Part G of the Building Regulations, a maximum water usage target has been set of 105 litres/ person / day. A design calculation is shown below for the proposed development.

Compliance Summary

Installation Type	Unit	Capacity / Flow Rate	Use Factor	Fixed Uses	Litres/ Person / Day
WCs (Single)	Flush volume (litres)		4.42	0	20.6
WCs (Dual)	Average Flush Volume (litres)	4.66			
Taps	Flow Rate (litres / minute)	3.5	1.58	1.58	7.11
Bath	Capacity to overflow (litres)	160	0.11	0	17.6
Shower	Flow Rate (litres / minute)	4.5	4.37	0	19.67
Kitchen Utility Tap	Flow Rate (litres / minute)	10.5	0.44	10.36	14.98
Washing Machine	Litres / kg dry load	8.17	2.1	0	17.16
Dishwasher	Litres / place setting	1.25	3.6	0	4.5
Waste Disposal	Litres / use		3.08	0	
Water Softener	Litres / person / day		1	0	
Grey Water					undefined
Rain Water					undefined
Total (Litres / person / day)					97.12
Normalisation Factor					0.91
Result Total (Litres / person / day)					98.03

4 PLANNING POLICES AND PROJECT REQUIREMENTS

- 4.1 National, regional and local planning policy pertinent to this energy statement considered in detail below.

National Planning Policy – National Planning Policy Framework

- 4.2 The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these are expected to be applied. The policies contained within the framework articulate the Government's vision of sustainable development, which should be interpreted and applied locally to meet local aspirations. The NPPF has

replaced the previous series of Planning Policy Statements (PPS) and constitutes a material consideration in planning decisions.

Regional Planning Policy - Greater Manchester

- 4.3 The Spatial Development Strategy for Greater Manchester includes objectives to reduce the capital's impact on, and exposure to the effect of climate change. Policies appropriate to the Rochdale Road site include:

Policy GM-S 2 Minimizing Carbon Dioxide Emissions

- 4.4 Development proposals should make the fullest contribution minimizing carbon dioxide emissions in accordance with the following energy hierarchy:

- BE LEAN: Use Less Energy
- BE CLEAN: supply energy efficiently
- BE GREEN: use renewable energy

- 4.5 To meet the 2038 carbon neutrality target, all new homes and commercial/industrial buildings will need to be net zero carbon by 2028. The Mayor will work with boroughs and developers to ensure that major developments meet the following targets for carbon dioxide emission reduction in buildings. These targets are expressed as minimum improvements over the Target Emission Rate (TER) outlined in the national Building Regulations. For domestic dwellings the targets are as follows:

- 2010 - 2013 25% improvement on 2010 Building Regulations
- 2013 - 2016 35% improvement on 2013 Building Regulations
- 2016- 2031 Minimum 35 % on 2013 Building Regulations

- 4.6 Major development proposal should include a detailed energy assessment to demonstrate how the target for carbon emissions reduction, outlined above, are to be met within the framework of energy hierarchy. The carbon reduction targets should be met on-site. Where it is clearly demonstrated that specific targets cannot be achieved on-site, any shortfall may be provided off-site or through a cash-in-lieu contribution to the relevant borough to be ring-fenced to secure delivery of carbon dioxide savings elsewhere.

Sustainable Design and Construction

- 4.7 Development's proposals should demonstrate that sustainable design standards are integral to the proposals, including its construction and operation, and ensure that they are considered at the beginning of the design process.
- 4.8 Major development proposals should meet the minimum standards outlines in the mayor's supplementary planning guidance. The standards include measures to achieve other policies in this plan and the following sustainable design principles:
- Minimizing carbon dioxide emissions across the site, including the building

and services (such as heating and cooling systems).

- Avoiding internal overheating and contributing to the urban heat island effect.
- Efficient use of natural resources (including water), including making the most of natural systems both within and around buildings.
- Minimizing pollution (including noise, air and urban runoff).
- Minimizing the generation of waste and maximizing re-use or recycle.
- Avoiding impacts from natural hazards (including flooding).
- Ensuring developments are comfortable and secure for users, including avoiding the creation of adverse climatic conditions.
- Securing sustainable procurement of materials, using local supplies where feasible.
- Promoting and protecting biodiversity and green infrastructure.

Policy 5.6: Decentralized Energy in Development Proposals

- 4.9 Development proposals should evaluate the feasibility of Combined Heat and Power (CHP) systems, and where a new CHP system is appropriate also examine opportunities to extend the system beyond the site boundary to adjacent sites. Major development proposals should select energy systems in accordance with the following hierarchy:

1. Connect to existing heating or cooling networks;
2. Site wide CHP network;
3. Communal heating and cooling

Policy 5.7: Renewable Energy

- 4.10 Major development proposals should reduce the potential for overheating and reliance on air conditioning systems and demonstrate this in accordance with the following cooling hierarchy;

1. Minimize internal heat generation through energy efficient design.
2. Reduce the amount of heat entering a building in summer through orientation, shading, albedo, fenestration, insulation and green roofs and walls.
3. Manage the heat within a building through exposed internal thermal mass and high ceilings.
4. Passive ventilation.
5. Mechanical ventilation.

6. Active cooling systems (ensuring they are the lowest carbon options)

Policy Summary

- 4.11 This energy statement outlines how the proposed development will meet the energy requirements of Part L1A of the Building Regulations.
- 4.12 The Energy Statement will provide calculations for the carbon dioxide emissions and energy demand covered by Part L Conservation of Fuel and Power of the 2013 Building Regulations.
- 4.13 The Plan hierarchy will be followed and a final recommendation for how the proposed development will meet the energy requirements outlined within the local planning policy will be given.
- 4.14 **Use less energy:** The energy demand of the proposed domestic and non- domestic development parts, will be reduced by improving the building fabric performance, through the incorporation of energy efficiency measures
- 4.15 **Supply Energy Efficiently:** Opportunities for linking into an existing or planned decentralized energy network have been explored and detailed in paragraphs below.
- 4.16 **Use Renewable Energy:** A percentage reduction in the carbon emission of the proposed development will be achieved through use of on-site renewable energy generation.

Energy Targets

- 4.17 The development is subject to the following key policy targets:

Minor Residential dwelling (9 dwelling or below) are required to demonstrate a 35% reduction in CO² over and above Building regulations 2013.

The Development is a new build and thus will fall under Part L1A of the building regulations for all residential parts.

5 CALCULATION METHOD

Baseline Energy and Carbon Dioxide Emissions

- 6.01 A total baseline energy demand and carbon dioxide emissions of the entire development will be established prior to the inclusion of any measures to reduce carbon dioxide emissions.
- 6.02 The estimated annual energy demand and carbon dioxide emissions for the house within the proposed development has been calculated using the Standard Assessment Procedure (SAP) methodology. SAP is the national calculation methodology accepted for the energy rating of domestic buildings.
- 6.03 SAP Calculations have been carried out on the house, details of which can be found in Appendix A.

Part L 2013 Baseline

- 6.04 Table 1 shows the whole development baseline Regulated & Total CO² Emissions

Baseline Carbon Dioxide Emissions	
	Carbon Dioxide Emissions (Kg CO ² /yr)
	<i>Residential</i>
Part L (2013) Baseline	1380

Energy Efficiency Measures

- 6.05 Minimizing the requirement for energy is the first step that should be considered. The rate at which energy is lost from a building greatly influences the annual heat load, and therefore the CO² emissions and energy requirements of that building. Energy requirements for hot water applications are essentially independent of improvements to the building's fabric efficiency as these are functions of occupancy and usage rather than rate of heat loss. The main areas where the efficiency of a building can be improved are details below.

Building Fabric's Thermal Transmittance

- 6.06 Building fabric thermal transmittance is measured by the U-value of each building element in watts/m²/K. the U-value is essentially a measure of the rate at which energy is lost through a building element; the greater the U-value, the higher the rate of loss.
- 6.07 Table 2 shows the fabric performance levels assumed in relation to the minimum requirements of the 2013 Building Regulations for the development.

Building Element/Characteristic	Proposed Development	Building Regulations Part L Requirements
Exterior Walls U value	0.18 W/m ² K	0.28 W/m ² K
Floor U value	0.12 W/m ² K	0.16 W/m ² K
Roof U value	0.12 W/m ² K	0.16 W/m ² K
Window U value	1.2 W/m ² K	2.0 W/m ² K
Door U value	1.8 W/m ² K	2.0 W/m ² K
Design Air Permeability	5.0	10.0

Table 2: Proposed fabric efficiency standard versus Part L1A acceptable standards

Air Permeability

- 6.08 Air Permeability is a measure of infiltration. It indicates how often the entire air quantity in a building is exchanged with outside air within 1 hour without any ventilation in place. Any air exchange with outside air is carrying heat energy away from the building, resulting in a higher heating load. From an efficiency perspective, lower air permeability levels are desirable, however reduced air permeability.
- 6.09 As this is a new build an air test is required under building regulations, a suggested air test result of 5.0 is used.

Thermal Bridging

- 6.10 Thermal bridging of junctions is the loss of heat energy through the junction between different building elements (such as a wall and window) or where a building element changes direction (such as a corner). Such areas can result in breaks in continuity of insulation that can form 'bridges' for heat energy to escape from the building.
- 6.11 The proposed development is a new build therefore 'Accredited Thermal Bridge details' are suggested with an overall Y-value of 0.062

Thermal Mass and Solar Gain

- 6.12 Thermal Mass and passive solar gains are two related aspects of efficient building design. Thermal mass is the ability of the fabric of the building to absorb excess heat. If effectively utilized, it can reduce heating and cooling loads and, in some cases, remove the requirement to provide air conditioning.
- 6.13 Passive solar gain is the use of heat absorbed by the building to contribute towards the heating demand of that building. Passive solar gain is a complex issue requiring numerous criteria to be met to be effective. Correct orientation as well as correct integration of glazed areas and high thermal mass elements is essential. High thermal mass elements typically have a far higher environmental impact than low thermal mass. The benefits of passive solar gain must be carefully weighed against the environmental cost and design restrictions imposed upon a development.
- 6.14 The proposed development considers use of the benefits of thermal and solar gain wherever possible.

Space Heating and Hot Water

- 6.15 Through improvements to the fabric efficiency and thermal properties the space heating requirement has been reduced.
- 6.16 The house will use a minimum of space heating relying on a highly insulated and airtight thermal envelope.
- 6.17. The use of a gas fired combi boiler with integrated flue gas heat recovery is suggested to ensure the most efficient space and water heating system

Lighting and Appliances

- 6.18 High efficiency low energy lighting and controls will be specified throughout.
- 6.19 Energy efficient appliances, every effort will be made by the developer to specify efficient appliances to be installed. However, it will be the final decision of the owner to specify the appliances

Lean Case CO² Emissions

6.20 The overall effect on the demand and associated CO² emissions of incorporating the energy efficiency measures detailed above into the proposed development would be as follows:

Be Lean	
	Carbon Dioxide Emissions (Kg CO²/yr)
	<i>Residential</i>
Part L (2013) Baseline	1380
After Be Lean Measures	1320
% Reduction over baseline	4.3%

Table 3: Lean Development CO² emissions and energy requirements

6.21 The use of energy efficiency measures would reduce regulated CO² emissions in comparison to the 2013 Building Regulations Compliance case by 4.3%

6.22 Further calculations can be found in the SAP worksheets in Appendix A

BE CLEAN: Supply Energy Efficiently

- 6.23 Connection to a decentralized energy network and the use of Combined Heat and Power (CHP) is a recognized method of generating energy more efficiently.
- 6.24 The proposed development at comprises of 1 dwelling and therefore the feasibility of connection to de-centralized energy network is not required to be investigated, though a basic assessment has been explored and taking into consideration the site's location, size and design.
- 6.25 Based upon research, there is no existing or proposed heat networks or suitable heat sources, or heat loads, within 1000m of the proposed development. For this reason, connection to a de-centralized heat network has been identified as unfeasible.

Be Clean	
	Carbon Dioxide Emissions (Kg CO²/yr)
	<i>Residential</i>
Part L (2013) Baseline	1320
After Be Lean Measures	1320
% Reduction over baseline	0.0 %

Table 3: Clean Development CO² emissions and energy requirements

On-Site CHP

6.26 For the reason outlined below, it has been concluded that on-site CHP would not be a suitable heat source for a development of this size.

- **Efficiency:** Due to the size of the development, 1 house, the development is not of a suitable size to benefit from CHP being below 500-unit threshold the GLA has indicated for CHP
- **Cost of installation** – The base of installation of CHP is significant and would be a prohibitive cost to progress of a development of this size

6.27 Therefore, it is concluded that CHP is not suitable for this development.

Community Heating

6.28 Due to the small nature of the development, it is not perceived to be suitable for a community heating system.

Green Measures: Low Carbon & Renewable Energy

6.29 To achieve the Greater Manchester GM-S 2' CO² reduction target, CO² reductions from on-site renewables sources will be required. Analysis of potential technologies is carried out below.

Biomass Boiler

6.30 Biomass boilers generate heat on a renewable basis as they are run on biomass fuel which is carbon neutral. A biomass boiler would require a central plant room and heat distribution network and would therefore be liable to high capital and running costs.

6.31 Whilst technically feasible, a biomass boiler is not appropriate for this development for the due to the small natural of the development.

Ground and Air Source Heat Pumps (GSHPs and ASHPs)

6.32 Heat Pumps upgrade energy from the ground or air and utilize it for space heating, hot water and cooling. They can provide substantial reductions in energy.

6.33 However, GSHPs require costly ground excavation works to bury the coils – boreholes would be required for the proposed development due to the high space requirements of ground coils and this is not possible on this site.

6.34 Air Source Heat Pumps (ASHPs) are a more economical alternative to GSHPs as they do not require ground works. However, the performance of ASHPs can be lower than for GSHPs are therefore the reductions in CO₂ are correspondingly low.

6.35 ASHP are not considered suitable for this development

Micro Wind Turbines

6.36 Small rooftop wind turbines are designed to generate electricity from the wind for use within each dwelling.

6.37 Urban rooftop wind turbines do not generally perform sufficiently well to warrant their installation, due to the low and turbulent wind conditions present. They are therefore likely to remain technically unfeasible.

6.38 It has therefore been concluded that wind turbines are not a suitable technology for the proposed development.

Solar Thermal Panels – Possible Technology

6.39 Solar thermal panels use the sun's energy to generate hot water for each dwelling. Due to the seasonality of solar radiation, solar thermal panels can provide up to 60% of a dwellings hot water demand, with the remainder being provided as top-up by an

electric immersion heater. They are a robust technology that provides substantial benefits to residents in terms of 'free' energy. Solar thermal panels for this project would be difficult though not impossible to integrate, the property is of small size and would best suite a combi boiler to provide space heating, integrating solar thermal with a gas fired combi boiler is problematic. For this reason this technology has been ruled out

Photovoltaic Panels - Proposed Technology

6.40 Photovoltaic Panel have been identified as a feasible technology for incorporation into the residential development. Due to the technical and economical case for this technology plus this technology will deliver the most significant CO² reductions.

6.41 To achieve the balance of the CO² reductions, it has been estimated that a total of 1.25 kWhp Solar PV panels would have to be fitted to the roof of the building. See appendix for location and maintenance details

CO² Emissions following Green Measures

6.42 The table below summarises the CO² reductions achieved from all Be Lean, Be Clean and Ge Green Measures. calculations can be found in the SAP worksheets in Appendix A

Be Green	
	Carbon Dioxide Emissions (Kg CO²/yr)
	<i>Residential</i>
After Be Lean Measures	1320
After Ge Green Measures	840
% Reduction over baseline	34.8 %

Table 3: Green Development CO² emissions and energy requirements

7 CONCLUSION AND SUMMARY

- 7.1 The Energy Statement outlines how the proposed development at Land adjacent 1133 Rochdale Road will meet the energy requirements as specified by the Greater Manchester Policy 'Minimising Carbon Dioxide Emissions'.
- 7.2 The energy strategy for the development has, at its core, a reduction in energy use through adopting a high standard of building fabric performance, high levels of air tightness, which exceeds the minimum requirements of Part L1A for fabric efficiency standards.
- 7.3 Supply Energy Efficiently requirements have been explored and discounted based upon the distance to the potential district heating network exceeding 1km and the small size of the development. These factors make the connection to the de- centralised energy network unfeasible for the proposed site at Canberra Road.
- 7.4 CO² emission reduction summarized in the table below

Carbon Dioxide Emissions	
Carbon Dioxide Emissions (Kg CO ² /yr)	
	<i>Residential</i>
Part L (2013) Baseline	1380
After Be Lean Measures	1320
After Be Lean Measures	1320
After Be Green Measures	840
% Reduction over baseline	39.1

APPENDIX A

Solar PV panel - Maintenance

Although a solar PV installation does not need a lot of attention to continually function correctly, it is prudent to review the system from time to time, especially if it does not have a monitoring system that will alert you of any issues that may arise with the system.

It is recommended an annual inspection of the system by a technician to confirm it is in good working order and carry out any necessary preventative action to avoid future, unforeseen issues with the system.

Annual maintenance includes the following;

Visual inspection of components to include:

- Solar PV modules – check for any issues, including signs of damage or stress on the glass / frames / cabling / joints, where accessible
- Mounting system – inspect framework, fixing points and module clamps for integrity and security, where accessible
- Inverters – ensure correct general operation, display functionality and cable connections
- Generation meter – check meter display and function
- Cabling and connections from PV array to mains supply connection, where accessible

Testing to include:

- Electrical periodic testing of AC circuit(s)
- DC Array test report (where possible) (Voc / Isc / irradiance / insulation)
- Inverter protection compliance (G83/G59)
- Cleaning of inverter(s) to include:
 - Clearing dust from heatsinks / air intakes
 - Removing and clearing fans, where accessible

APPENDIX B

BLOCK COMPLIANCE

Calculation Type: New Build (As Designed)

Block Reference	000001	Issued on Date	
Block Name	Land Opp 1133		
Assessor Details	Mr. Ikechukwu Diala-Uka, Diland EPC, Tel: 02477360076, info@dilandepc.co.uk		Assessor ID W462-0001
Client			

Block Compliance Report - DER

Block Reference: 000001		Block Name: Land Opp 1133			
Property-Assessment Reference	Multiplier	Floor Area (m ²)	DER (kgCO ₂ /m ²)	TER (kgCO ₂ /m ²)	% DER/TER
542312-001	1	37.49	22.89	22.91	0.10 %
542313-001	1	37.49	21.33	21.14	-0.88 %
542315-001	1	39.02	18.00	18.06	0.35 %
542316-001	1	39.02	20.15	19.86	-1.45 %
541317-001	1	75.55	15.98	16.18	1.22 %
541318-001	1	75.55	15.98	16.18	1.22 %
542319-001	1	37.49	22.89	22.91	0.10 %
Totals:	7	341.61	137.22	137.25	
Average DER = 18.79 kgCO ₂ /m ²		% DER/TER	PASS		
Average TER = 18.84 kgCO ₂ /m ²		0.27 %			

Block Compliance Report - DFEE

Block Reference: 000001		Block Name: Land Opp 1133			
Property-Assessment Reference	Multiplier	Floor Area (m ²)	DFEE (kWh/m ² /yr)	TFEE (kWh/m ² /yr)	% DFEE/TFEE
542312-001	1	37.49	44.63	53.41	16.43 %
542313-001	1	37.49	38.15	44.45	14.16 %
542315-001	1	39.02	23.59	28.52	17.30 %
542316-001	1	39.02	32.75	37.88	13.55 %
541317-001	1	75.55	32.86	38.76	15.24 %
541318-001	1	75.55	32.86	38.76	15.24 %
542319-001	1	37.49	44.63	53.41	16.43 %
Totals:	7	341.61	249.46	295.19	
Average DFEE = 34.95 kWh/m ² /yr		% DFEE/TFEE	PASS		
Average TFEE = 41.33 kWh/m ² /yr		15.44 %			