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Palatine Road, Didsbury Resi

Environmental Standards Statement

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Glossary of Key Terms:

Abbreviation	Details
WLC	Whole Life Carbon
CWC	Crookes Walker Consulting
BER	Building Emission rate
BPER	Building Primary Rate
TER	Target Emission Rate
TPER	Target Primary Emission Rate
CIBSE	Chartered Institute of Building Services Engineers
UKGBC	The UK Green Building Council
EPC	Energy Performance Certificate
HQM	Home Quality Mark
MEP	Mechanical, Electrical & Public Health
M&E	Mechanical & Electrical
MVHR	Mechanical Ventilation Heat Recovery
EV Charging	Electric Vehicle Charging
ASHP	Air Source Heat Pump
GSHP	Ground Source Heat Pump
PV	Photovoltaics
WWHR	Waste Water Heat Recovery
CHP	Combined Heat & Power
MCC	Manchester City Council
PfE	Places For Everyone

1.0 Executive Summary

Crookes Walker Consulting (CWC) have been instructed to advise on the energy and carbon related consideration associated with the planning application for Palatine Road, Residential Development.

The creation of this Environmental Standard Statement is required by Manchester City Council as a means of clarifying how the compliance with the Councils Core Strategy (Policy EN4 & EN6) is to be achieved; it also expands on the project teams' approach to achieve low energy / low carbon dwellings.

The proposed residential development on Palatine Road consists of a thoughtfully designed mix of apartments, aimed at delivering sustainable and high-quality dwellings. The development prioritises sustainability throughout its lifecycle, adhering to the principles of Manchester's Core Strategy, the Places for Everyone Joint Plan, and the city's ambition to achieve net zero carbon emissions.

Key sustainability measures for the scheme include:

- Energy Efficiency and Carbon Reduction: A detailed SAP (Standard Assessment Procedure) assessment has been conducted to ensure optimal energy performance across all units. The development incorporates high-performance building fabric, energy-efficient systems, and renewable energy solutions to minimise carbon emissions.
- Thermal Comfort and Overheating Prevention: An overheating assessment has been undertaken to address thermal comfort for residents, particularly in the face of increasing climate variability. This ensures that homes remain comfortable and resilient while meeting regulatory and comfort standards.
- Compliance with Local and Regional Policies: The scheme aligns with Manchester City Council's Core Strategy, contributing to sustainable urban living by promoting low-carbon construction and integrating green infrastructure. It also supports the objectives outlined in the Places for Everyone framework, fostering environmental sustainability alongside housing delivery.
- Net Zero Ambition: The project incorporates innovative design and technology to target an operational net zero carbon ready building. This aligns with Manchester's climate action goals and ensures that the development contributes to a more sustainable future for the city.

2.0 Introduction

Crookes Walker Consulting (CWC) are working collaboratively with a team of design consultants and other industry professionals, to design a sustainable residential development located along and referred to as 'Palatine Road', which is located within the Borough of Greater Manchester.

The project team have collaborated and explored various potential design solutions and have agreed upon an approach that will result in a sustainable and low energy building, as far as is reasonably practical, given site parameters, authority requirements / limitations and financial restraints etc.

This report clarifies the project teams' approach to sustainable design and summarises many of the measures that have been incorporated within designs, or considered, to achieve a sustainable and low energy / building with minimum whole life carbon emissions.

The design solutions are subject to development change, however, the fundamental approach described within this document, will not change.

2.1 Existing Site Overview

Palatine Road, situated in Manchester, is located next to the Britannia Hotel, directly opposite the hotel's car park, and just a short distance from the River Mersey. The existing site features three residential buildings, each comprising multiple apartments.

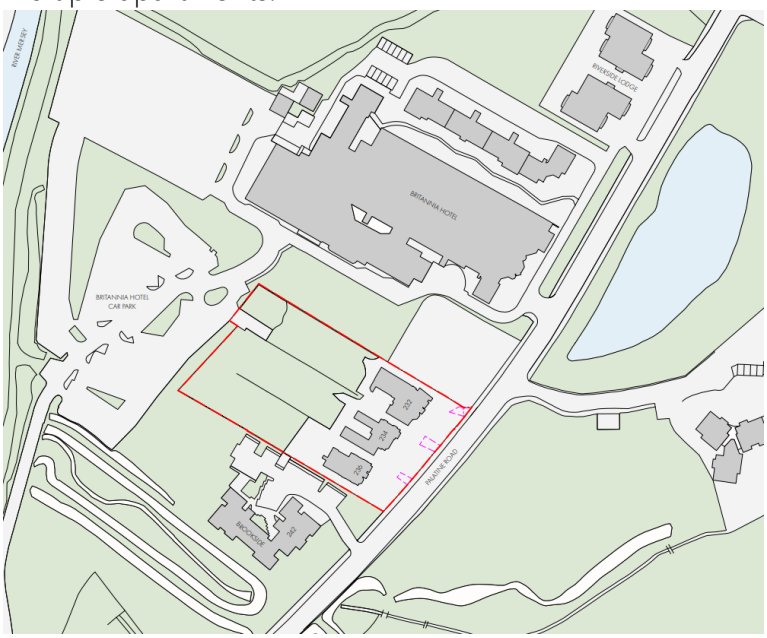


Figure 1 – Site Location

The existing site location postcode is M20 2WF.

2.2 Proposed Site Overview

The proposed development aims to transform the site into an attractive, well-planned residential community. It will feature a modern 88 high-quality apartments / duplexes.

The design makes use of land located in flood zone 3 by incorporating flood-resilient measures, such as elevated structures and efficient drainage solutions, ensuring safety and sustainability. A part-basement car parking facility is included, maximizing space while keeping the area free from surface-level congestion. The dwellings are designed to blend seamlessly with its surroundings, with greenery and proximity to nature providing a welcoming environment for residents.



Figure 2 – Site Location

The Proposed site location postcode is M20 2WF.

3.0 Sustainable Design Approach

The proposed Residential Development has been designed in a manner that is consistent with the ethos of Manchester City Council and In-line with the UKGBC framework for net zero carbon ready buildings.

Whilst options for designs solutions have been determined, there are ongoing design developments which seek to further optimise value for the scheme and further enhance sustainability credentials.

3.1 Energy Hierarchy

The progression of the project design solutions has adopted an approach in which the need for energy use is reduced in the first instance and then energy efficient measures are explored and then the use of low / zero carbon technologies are considered.

This approach is summarised within the below diagram and the following sections of this report, elaborate on each element of this hierarchical approach.

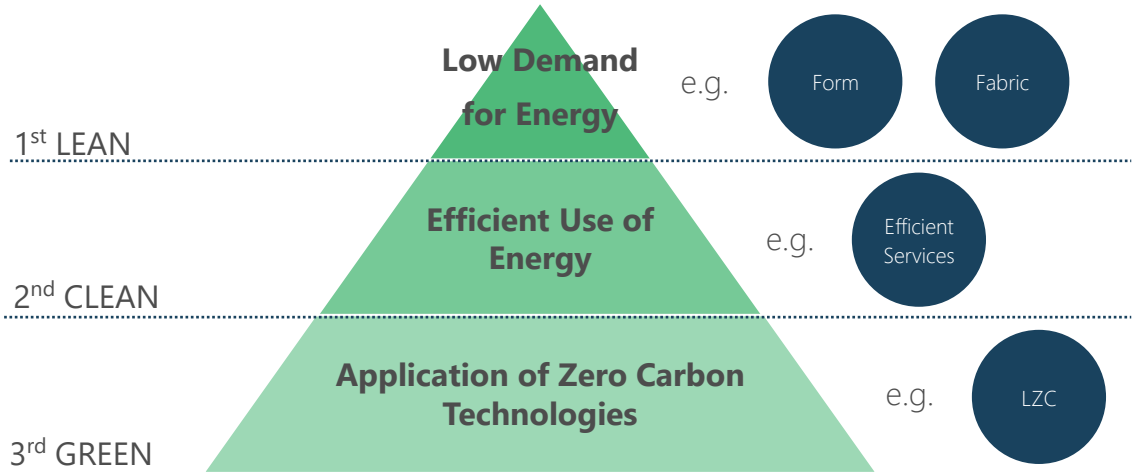


Figure 3 Energy Hierarchy Diagram

3.1 Additional Project Sustainability Objectives

Palatine Road seeks to exceed minimum legislative targets and is seeking to achieve credentials that will demonstrate the building has been designed in a sustainable, responsible and quality manner.

3.1.1 Energy Performance Certificate Rating of 'B'

Each dwelling will achieve an EPC rating of 'B' or greater.
A SAP assessment and EPC assessment has been undertaken and additional assessments will be undertaken in future design stages to demonstrate how an EPC 'B' rating can be achieved, with the use of high performing fabric (specification shown in Section 4.0 of this report) and air source heat pump technology for hot water generation among other interventions as outlined within this report. Results for this development can be found in Appendix 1.

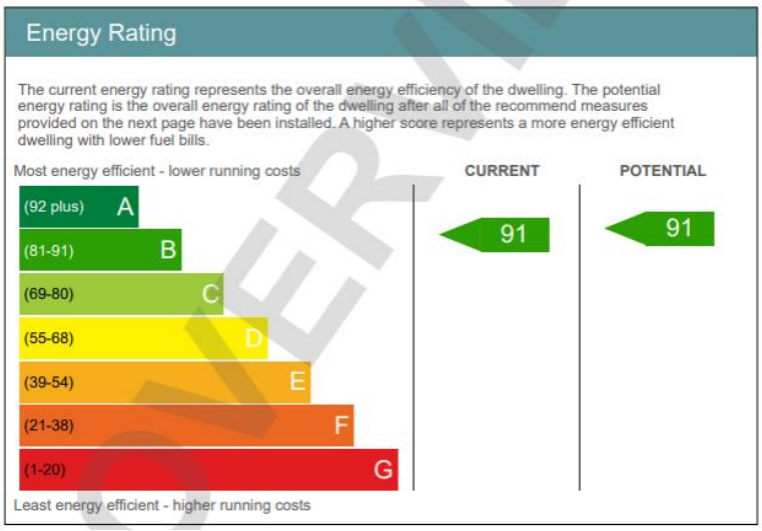


Figure 1 - Example "As Designed" EPC Result for typical apartment within proposed development

3.1.2 Home Quality Mark

The Home Quality Mark (HQM) rates a home across three criteria: cost, well-being and footprint. Subsequently, the HQM places more emphasis on the well-being of its occupants. Therefore, the marking system measures the cost of running the home, the occupants' well-being, and the property's digital connectivity.
The Palatine Road has been designed at planning stage in a manner that a Home Quality Mark (HQM) rating could be achieved if later required.

Figure 2 - HQM Logo

4.0 Energy Conservation ("Be Lean")

This section provides an overview of the current strategy for designing Palatine Road in a manner that will reduce the energy demand of the building by passive design measures.

4.1 Sustainable Building Fabric Designs

The buildings "fabric" (e.g. façade, roof, glazing etc) has been designed in a manner that exceeds the minimum requirements which are defined within Approved Document Part L Volume 1.

The below Table 1 demonstrate this by showing the minimum fabric values and compares against the proposed values and associated betterment percentage.

Table 1 - Comparison of Minimum Fabric Values and Enhanced Proposed Fabric Values to achieve a low energy building

	Minimum Fabric Values (For Building Regulation Part L Compliance	**Proposed** Project Fabric Target (Note 1)
External Wall	0.26 W/m^{2}K	0.12 W/m^{2}K
Window	1.60 W/m^{2}K No limiting g-value	1.20 W/m^{2}K g-value 0.4
Roof	0.16 W/m^{2}K	0.12 W/m^{2}K
Ground/ Exposed Floor	0.18 W/m^{2}K	0.12 W/m^{2}K
Thermal Bridging	n/a	Enhanced
Air permeability	10.0 m^3/hr/m^2 @ 50 Pa	3 m^3/hr/m^2 @ 50 Pa

Note 1: Final values are subject to ongoing design and construction development.

4.2 Avoidance of Overheating

CWC have created a dynamic thermal model to assess the risk of overheating as defined within Approved Document O and the referenced CIBSE's TM 59. This assessment has taken place to ensure comfortable / sustainable design environments are in place that do not rely on the need for mechanical cooling, which is energy intensive.

The fabric improvements noted above along with suitable window openings to outside have resulted in a passively cooled building design.

An acoustic specialist has been actively involved in the design process to ensure comfortable living environments. Their expertise has guided the implementation of soundproofing measures and quiet ventilation systems, to address both external noise and internal system operation. This ensures residents benefit from a peaceful, well-ventilated, and high-quality living space.

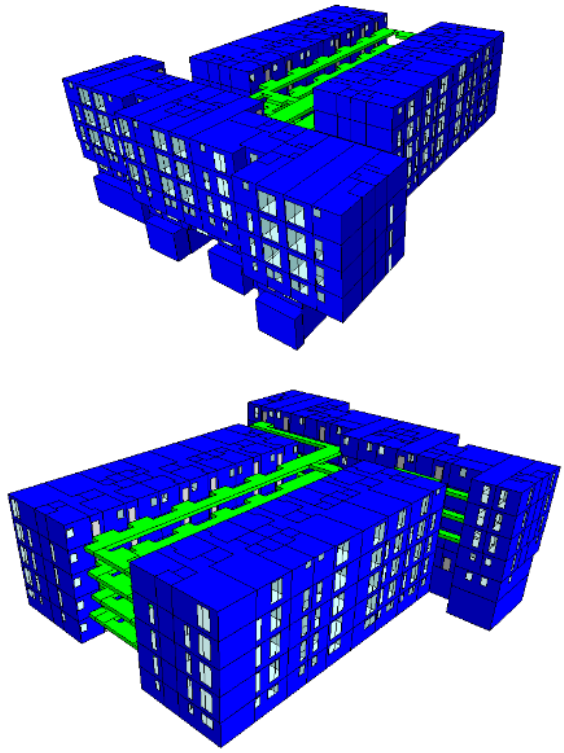


Figure 4 - Views of Dynamic Thermal Model Used to Assess & Mitigate the Risk of Overheating

5.0 Energy Efficient Operation ("Be Clean")

In-line with the UKGBC framework for net zero carbon buildings, the strategy for the Palatine Road residential development has been to reduce the energy demand of the building and design the building in such a way that will benefit from grid supplied electricity, which is continuously becoming "greener" (i.e. less CO_2 per kWh). This is demonstrated within figure 5 below.

Palatine Road looks to achieve the principles set out within the UKGBC framework by:

a. Selecting space and water heating technologies which are electrically powered (i.e. no fossil fuels on site) such that the building can benefit from the ongoing trend of greener electricity supplied form the grid,

b. Make use of energy efficient fabric and efficient building services systems to significantly reduce the demand for energy on site (described within this report in further detail), and

c. Provide on-site energy generation from renewables and / or use low carbon technologies (e.g. heat pumps) so far as is reasonably and economically practical.

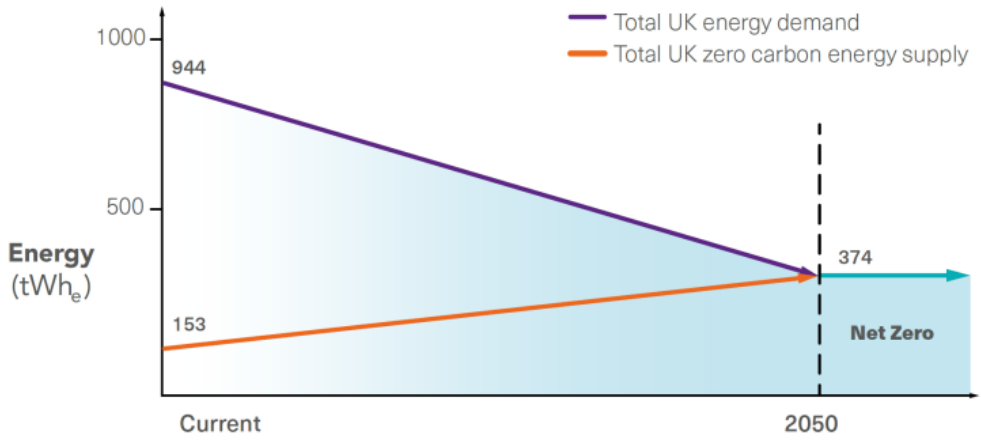


Figure 5 - In 2050, the UK's total energy demand will need to be supplied by low carbon energy ('Paris Proof' Targets)

An overview of the considered low energy, low carbon design solutions is described on the following pages.

5.1 Electric Panel Radiators with App (mobile Phone) Control Functionality

Space heating to all units is likely to be achieved via direct electric panel radiators. As these do not rely on the storage or distribution of hot water there is no wasted heat and as such, they provide a very energy efficient design solution in comparison to wet system (i.e. boiler system). There is also less embodied carbon associated this solution, as there is far less material involved with the installation works compared to typical alternatives (e.g. central boiler system).

It is proposed the panel heaters are capable of Wi-Fi connectivity, to allow residents/tenants remote control of each panel heater via an Android or iPhone App. App control can allow for the following control features for the residents/tenants:

- Viewing of current temperature readings
- Setting of desired temperature
- Day and night temperature settings
- On/off control of each panel heater
- Daily and weekly time scheduling

The panel heater will be capable of being controlled without the use of an App, through manual adjustment of the thermostat at the panel heater. Panel heaters shall include smart adaptive functions to recognise the time the space takes to heat up and also recognise when a window is open in order to switch off automatically to prevent wasting energy.

The use of electric storage heaters is also currently under review as these have the capability of making use of nighttime electricity, which has a lower carbon emission factor per kWh.



Figure 6 - App Controllable Radiator (Example shown is Adax Neo)

5.2 Mechanical Ventilation with Heat Recovery

Mechanical ventilation with heat recovery' (MVHR) unit could be introduced to houses and apartments. This has the potential of several benefits from a sustainability perspective as follows. In the majority of domestic bathrooms and kitchens, a local dedicated fan is provided which exhausts warm air to the outside; this is essentially "dumping" useful room heat to outside and is thus wasted energy.

With the MVHR unit, circa 85% of the heat extracted from bathrooms and kitchens can be captured (during colder months) and used to heat the incoming supply air. As such this is a very energy efficient solution relative to alternative solutions. This strategy is the same strategy for dwellings complying with the widely recognised Passivhaus standard. The MVHR unit can be provided with an intelligent integral control system which enables the heat recovery device to be bypassed during the warmer months. The MVHR unit flow rates can be increased during the summer months to also provide "free cooling".

The alternative ventilation solution to the MHVR presently considered is the use of a combined air to water heat pump system that works in conjunction with an MEV ventilation system; the final solution for ventilation shall be determined within subsequent design stages.

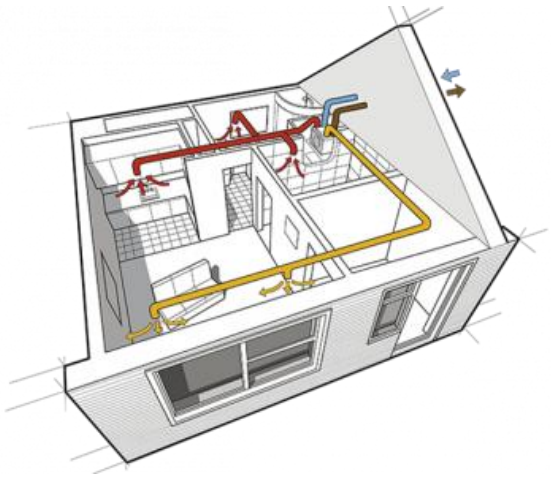


Figure 7 - Example of MVHR System (Image Courtesy of Xpelair)

5.3 Intelligent Lighting

Low energy LED luminaires are proposed throughout the scheme for landlord areas, apartments and dwellings.
All landlord areas, with the exception of plantrooms, will make use of lighting presence detectors and / or daylight dimming controls to keep lighting energy use to a minimum.

5.4 Low Flow Appliances

It is proposed that sanitary appliances and white goods such as dishwashers and washing machines are selected to achieve low water flow rates without compromising on comfort or functionality.

5.5 Metering Strategy

CWC propose all apartment utility meters are located within the apartment and in a location that is easily accessible to the tenants (e.g. within the utility store, on the wall). This will enable tenants to monitor their ongoing energy / water usage and consider how to better manage their consumption.
In a similar manner, all landlord supplies shall be meters and made easily accessible.

5.6 EV Charging

EV charging propose sustainable design, offering significant environmental and social benefits. Environmentally, it supports the reduction of carbon emissions by encouraging the use of EVs, which produce no tailpipe emissions, and can be further enhanced when paired with renewable energy sources like solar power. Socially, it provides convenience for residents by making charging infrastructure easily accessible, promoting the adoption of clean transportation.

The Palatine Road residential development includes conveniently located parking spaces on the ground floor at the front of the apartment block, each parking space will be equipped with an EV charger, promoting sustainable living and supporting the transition to electric vehicles.



Figure 8 - Example of EV Charging

6.0 Implementation of Renewable and Low Carbon Technologies ("Be Green")

Once energy demand has been reduced to a minimum by implementing measures described within this report, additional renewables are proposed to offset the site energy consumption.

The below summarises potential solutions for use within each unit.

6.1 Air to Water Heat Pump Technology

The currently proposed solution for providing hot water to apartments and dwellings is the use of air to water source heat pumps. This can be provided as a stand-alone system (as shown within the adjacent image) or as part of the apartments ventilation system (MEV type system) for maximum efficiency. A system of this type is circa three times more energy (and carbon) efficient than a traditional direct electric unvented cylinder.



Figure 9 - Air to Water Heat Pump

The use of an alternative technology which utilises phase change material is under consideration, which has the advantage of making use of electricity supplied at night, for heating water during the day. The use of this Economy7 type tariff may result in lower carbon emissions and reduced operational costs for tenants.

When linked to a hot water storage cylinder, the ASHP can store and distribute heated water to meet the needs of both domestic hot water and space heating systems. This configuration ensures a steady supply of hot water for dwelling use, while simultaneously powering space heating.

6.2 Solar Photovoltaics (PV)

All apartments and dwellings and internal landlord spaces are heated via electric equipment (i.e. electrical panel rads and electric storage cylinders). Offsetting the electricity demand with solar photovoltaics (PV), therefore provides an effective solution which can be utilised throughout the year, albeit more beneficial during the summer months.



Figure 11 - Example of Rooftop Solar PV

The use of PV aligns with the principles set out within the Places for Everyone (PfE) framework. A carefully designed PV layout has been incorporated into the design plans as shows below, albeit the final arrangement will be determined within future design stages, which will take into location of drainage vent points, maintenance and access routes, shading, etc,

The PV has been located to minimise visibility from the main road.

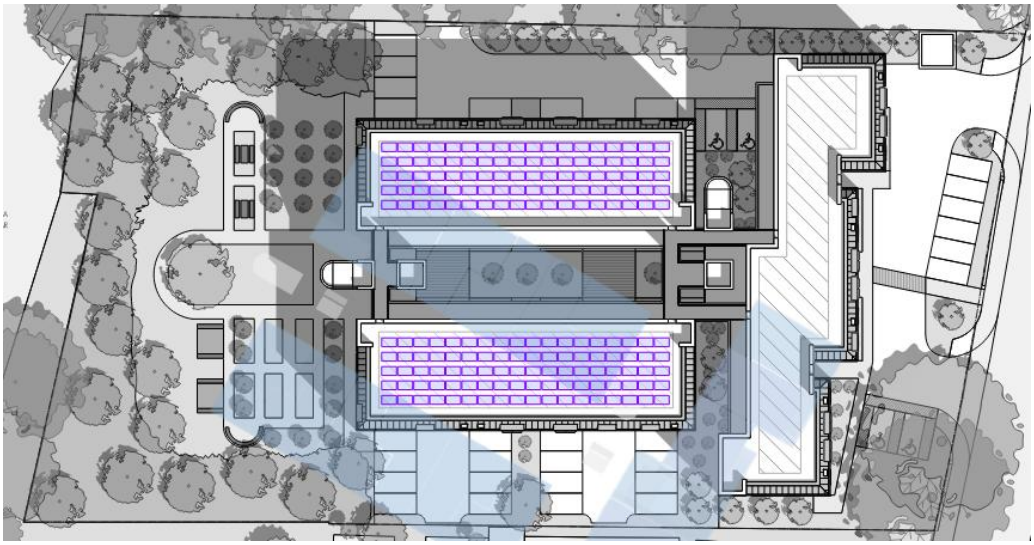


Figure 12 – Indicative PV Layout

6.3 Waste Water Heat Recovery

A Waste Water Heat Recovery (WWHR) device could be incorporated to pre-heat the water supply to showers and baths by recuperating heat from outgoing waste water via a robust heat exchanger). An example of a WRAS approved WWHR device is indicated within figure 13.



Figure 13 –Waste Water Heat Recovery Device (Image courtesy of Zypho)

6.4 Discounted Renewables and LZC Technologies

The following summarises other renewable and low carbon technologies which have been considered and discounted.

	Low and Zero Carbon Technology Appraisal
Ground Source Heat Pump (GSHP)	There was potentially sufficient external space for boreholes and pipework; however, concerns over potential disruption to the landscape and uncertainty regarding the suitability of the available land made GSHP less favourable. Instead, ASHP provides better balance of cost, efficiency and practicality.
Solar Thermal	Appropriate for residential use due to their efficiency, versatility, and ability to significantly reduce energy costs and carbon footprints, however, it doesn't offset electricity for other purposes. PV deemed to be a better fit.
Combined Heat & Power (CHP)	There is no low temperature hot water heating system within the proposed design. If one were to be provided, there would not be an adequate constant base heating load to provide suitable payback for this technology.

Low and Zero Carbon Technology Appraisal	
Biomass	Site location, logistics and storage preclude this technology
Wind Turbines	The strobing effect and noise issues associated with this technology are not acceptable in this location as its surrounded by hotels and residential properties.
District Heat Network	Discussed in section 8.3

6.5 Whole Life Carbon Considerations

Whole life carbon has been carefully considered; however, at this stage of the design process, materials and methods have yet to be fully developed or specified. In the upcoming design stages, the following aspects will be evaluated to achieve the most optimal and sustainable solution:

- Materials and equipment procurement: Prioritising sustainably sourced materials and equipment with lower carbon footprints.
- Construction and installation processes: Identifying efficient and low-carbon methods for construction and installation.
- Structural solutions: Exploring innovative designs to minimise material usage while maintaining structural integrity.
- Low-carbon operational technologies: Selecting systems and technologies that reduce operational emissions and energy consumption, outlined in sections 5 & 6.
- End-of-life considerations: Addressing waste management, recycling, and reuse strategies to minimise carbon impact when the project reaches its end of life.

7.0 Manchester City Council Core Policy Compliance Strategy

This Environmental Standards Statement seeks to demonstrate that the design intent for the scheme is aligned with Manchester City Council's (MCC'S) aspirations in delivering sustainable developments. The environmental and energy strategy for the scheme has been developed using the following regulations and planning policies:

7.1 MCC Core Policy Requirements

The Manchester City Council, Manchester Core Strategy 2012 to 2027 document and planning policies have been utilised for assessment as follows. The following policies are extracted from the Manchester Core Strategy Document:

The wording below contained within Section 7.2 has been taken from the Councils Core Policy guidance as is appliable to Palatine Road.

Policy EN 4
Reducing CO_2 Emissions by Enabling Low and Zero Carbon Development

The Council will seek to reduce fuel poverty and decouple growth in the economy, growth in CO_2 emissions, and rising fossil fuel prices, through the following actions:

- All development must follow the principle of the Energy Hierarchy, being designed:
    - to reduce the need for energy through design features that provide passive heating, natural lighting, and cooling
    - to reduce the need for energy through energy efficient features such as improved insulation and glazing to meet residual energy requirements through the use of low or zero carbon energy generating technologies

- Wherever possible new development and retrofit projects, including energy generation plant, must be located, and designed in a manner that allows advantage to be taken of opportunities for low and zero carbon energy supplies.

- Where possible new development and retrofit projects will be used as a mechanism to help improve energy efficiency and provide low and zero carbon energy supplies to existing buildings.

- Where appropriate new development and retrofit projects will be required to connect to and/or make contributions to low or zero carbon energy schemes and/or to incorporate provision to enable future connection to any existing / potential decentralised energy schemes.

- The use of building materials with low embodied carbon in new development and refurbishment schemes.

Policy EN 6
Target Framework for CO_2 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 (domestic) or 12.2 (non- domestic) 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 CO_2 emissions for all phases of the development. Developments smaller than the above threshold but involving the erection of a building or substantial improvement to an existing building will also be expected to meet the minimum target, where viable, but will not be expected to submit an energy statement.

The target framework relates to three broad development locations and their potential for low and zero carbon, decentralised energy. The areas are defined as follows:

- Target 1 Network development areas: Locations where the proximity of new and existing buildings, the mix of uses and density of development provide the right conditions to support district heating (and cooling).

- Target 2 Electricity intense areas: Locations where the predominant building type has an all-electric fit-out such as retail units and leisure complexes.

- Target 3 Micro-generation areas: Locations where lower densities and a fragmented mix of uses tend to mean that only building scale solutions are practical.

Table 12.1 – Domestic CO_2 emissions reduction targets

Target	% Minimum Requirements
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

Where the CO_2 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.

Where the Council identifies an 'allowable solution', for example within an energy proposals plan, that would produce higher carbon reductions at no extra cost than that of achieving the '% Minimum requirement' (or required under building regulations if greater) the higher percentage reduction will be required. The cost comparison is based on the cost of incorporating the 'allowable solution' at design stage.

The energy statement will be required to be submitted at the outset of any proposed development (outline application or before). Developers will be permitted to use green infrastructure elements such as green roofs, green walls, street trees and waterways to contribute to compliance with CO_2 mitigation, subject to the energy statement incorporating evidence such as modelling to demonstrate compliance. Guidance on what the energy statement should contain and how to decide which target applies to a development proposal is given in Appendix A of the policy.

7.2 Strategy for Achieving Compliance with MCC Statutory Requirements

The statutory requirements as noted within section 7.1 above are achieved as described below.

Utilising the approved SAP 10.2 software all dwellings have been assessed, typically on an area-weighted block average of the sample.

The predicted energy and CO_2 emissions of the dwellings have been calculated as shown within the Appendix A Part L Compliance (SAP) Report.

The solutions which were deemed as a 'Pass' under the SAP 10.2 software indicate that the 'dwelling emission rate' (DER) typically achieved around a 50% betterment over the minimum 'target emission rate' (TER) requirements for Part L 2021. **Therefore all solutions identified far exceed the minimum council betterment of a 15% over Part L 2010.**

At this stage we have not defined the exact arrangement of solutions, as we do not to wish to limit solutions at this early project stage.

Solutions for achieving compliance and exceedance Part L 2021 are likely to include some of the following:

a) High-end fabric solutions
b) Air tight building – potentially 3 m^3 /h/m^2@50Pa
c) Solar photovoltaics
d) Air to water heat pumps e. Mechanical Ventilation with Heat Recovery
e) Efficient lighting.

See Appendix A for the full SAP assessment results.

8.0 Places for Everyone Compliance Strategy

The 'Places for Everyone' (PfE) Plan is a long-term plan of nine Greater Manchester districts (Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan) for jobs, new homes, and sustainable growth.

The Plan determines the kind of development that takes place across the city-region, maximising the use of brownfield land and urban spaces while protecting green belt land from the risk of unplanned development. It also ensures all new developments take a positive approach to renewable and low carbon developments and includes an expectation that new developments will be net zero carbon from 2038.

8.1 Strategy for Demonstrating Compliance with PfE Development Plan

8.1.1 Definition of Net Zero Carbon

As outlined in Section 5, there is a clear trajectory for the building to achieve net zero carbon by 2050. In the interim, the UKGBC (UK Green Building Council) has established interim targets that define net zero carbon standards for new builds today. These targets align with the RIBA 2030 Climate Challenge benchmarks, which set specific targets for achieving net zero carbon in new residential developments, as shown in the figure 14 below. This forms the basis of our understanding of the definition of net zero carbon and highlights our project's compliance with the Places for Everyone (PfE) targets.

			Analysed in this feasibility case study		
		Business as usual	Intermediate targets	Stretch targets	Net zero carbon targets
		From RIBA 2030 Climate Challenge and LETI Climate Emergency Design Guide			TBC
Operational energy	Regulated	31% carbon reduction (Part L, 2021)	75-80% carbon reduction (Future Homes Standard, 2025)	100% carbon reduction (speculative target)	Currently under development via the UK Net Zero Carbon Buildings Standard initiative
	Regulated and unregulated[33]	120 kWh/m²/year	60 kWh/m²/year	35 kWh/m²/year	
Embodied carbon	Upfront carbon emissions (construction only, module A)[34]	800 $kgCO_2e/m^2$	500 $kgCO_2e/m^2$	300 $kgCO_2e/m^2$	
	Embodied carbon emissions (whole life, modules A-C, excl B5 & B6)[35]	1200 $kgCO_2e/m^2$	800 $kgCO_2e/m^2$	625 $kgCO_2e/m^2$	

Figure 14 – Energy and embodied carbon performance targets for new-build homes

8.1.2 PfE Policy Requirements

Policy JP-S1
Sustainable Development

To help tackle climate change, development should aim to maximise its economic, social and environmental benefits simultaneously, minimise its adverse impacts, utilise sustainable construction techniques and actively seek opportunities to secure net gains across each of the different objectives.
In preparing plans, authorities should make as much use as possible of suitable previously-developed (brownfield) land and vacant buildings to meet development needs.

In bringing forward previously developed sites for development, particular attention will be paid to tackling land contamination and stability issues, ensuring that appropriate mitigation and remediation is implemented to enable sites to be brought back into use effectively.

Climate Change Commitments:

- Achieve carbon neutrality by 2038 while adhering to a carbon budget.
- Upscale solar photovoltaic energy, retrofit buildings, and reduce heating/cooling demand.
- Shift from gas heating to low-carbon alternatives and enhance sustainable travel.

Carbon and Energy Efficiency in Buildings:

- Retrofit existing buildings (homes and non-domestic) to reduce emissions.
- By 2028, all new buildings must achieve net zero carbon (operational and construction).
- Follow the energy hierarchy: prioritise fabric-first design, renewable energy, and carbon offset funds for residual emissions.

Table 2 - Best Practice Thresholds for Reducing Energy Demand and Onsite Renewable Energy Generation within residential developments

	Space Heat Demand	Hot Water Energy Demand	Renewable Energy Generation Targets
2021 - 2025	Houses (30kWh/m^2/Yr) Flats (25kWh/m^2/Yr)	20% energy demand reduction in the total heat required for water heating	*Photovoltaic installation: 20% ground floorspace

Renewable Energy & Decarbonisation:

- Scale up renewable energy (especially solar) and encourage community initiatives.
- Balance renewable energy benefits with potential environmental and social impacts.

Construction Lifecycle and Monitoring:

- Address embodied emissions in construction, repair, and demolition.
- Post-occupancy evaluations to monitor energy efficiency and reduce performance gaps.

Electric Vehicle (EV) Charging:

- EV charging points mandatory in new developments per Building Regulations.
- Consider user needs, accessibility, and management of charging points.

Policy JP-S2
Carbon and Energy
The aim of delivering a carbon neutral Greater Manchester no later than 2038, with a dramatic reduction in greenhouse gas emissions, will be supported through a range of measures including:

- Promoting the retrofitting of existing buildings with measures to improve energy efficiency and generate renewable and low carbon energy, heating and cooling;

- Promoting the use of life cycle cost and carbon assessment tools to ensure the long-term impacts from development can be captured;
- Taking a positive approach to renewable and low carbon energy schemes, particularly schemes that are led by, or meet the needs of local communities;
- Increasing the range of nature-based solutions including carbon sequestration through the restoration of peat-based habitats, woodland management, tree planting and natural flood management techniques;
- An expectation that new development will, unless it can be demonstrated that it is not practicable or financially viable;

    - Be net zero carbon(29) which applies:

    - from adoption – to regulated operational carbon emissions;
    - from 2028 – to all emissions 'in construction'.

    From 2025 development should also calculate and minimise carbon emissions from unregulated emissions alongside regulated emissions.

    - Developments must comply with 2022 Part L and Part S Building Regulations unless superseded by local/national policies and Include adequate EV charging points and future-proof for long-term energy demands.

    - Prioritise connection to renewable or adaptable low-carbon energy/heating/cooling networks.

    - Residential developments must meet specific energy demand reductions (e.g., space heating, hot water, and renewable energy generation with PV prioritized).

    - Provide detailed energy statements demonstrating carbon reduction efforts, overheating mitigation, post-occupancy evaluation, and whole life cycle emissions analysis.

    - To comply with policy JP-S3, heat and energy network assessments will be required as part of an energy statement to support planning applications for new developments within the identified "Heat and Energy Network Opportunity Areas" to demonstrate compliance with PfE energy policies, demonstrating consideration of:

- Identification of existing and proposed heat/energy loads;
- Identification of heat/energy supply sources;
- Identification of opportunities to utilise renewable and low carbon energy sources;
- Identification of opportunities to utilise waste and secondary heat sources;
- Impact of proposals and technology choices on local air quality;
- Design according to national best practice in relation to efficient heat network design (e.g. CIBSE CP1 Heat Networks: Code of Practice for the UK35, or equivalent); and
- Adopting appropriate consumer protection standards (e.g. Heat Trust36 or equivalent).

8.1.3 Strategy for Achieving Compliance with the PfE Development Plan

This report demonstrates how compliance is achieved with the PfE requirements as noted within sections 8.1.1 and 8.1.2.
The Palatine Road residential development has been thoughtfully designed to achieve carbon targets without relying on any additional carbon offsetting.
The sustainable development targets, as detailed in Sections 5 and 6, have been carefully considered and integrated into the approach. Compliance with the specified requirements is clearly demonstrated in the table below.

Table 3 – Compliance With The Best Practice Thresholds for Reducing Energy Demand and Onsite Renewable Energy Generation within residential developments

2021-2025				
Space Heating Demand ($kWh/m^2/Yr$)		Hot Water Energy Demand (Note 2)	Renewable Energy Generation	
PfE Target	Average Performance Achieved (Note 1)		PfE Target	Performance Achieved
25	20	20% energy demand reduction in the total heat required for water heating	Photovoltaic installation: 20% ground floorspace	PV covers 22.5% Ground floor Space

EV Chargers

The proposed EV chargers for the Palatine Road residential development, as detailed in Section 6.3, complies with the requirements outlined in the Places for Everyone (PfE) framework.

Heat Networks

We have reviewed the requirements for heat networks as outlined in the Places for Everyone (PfE) framework. While we explored the possibility of establishing our own heat network, our analysis concluded that it is not a viable option at this time. There is no local heat network available to connect to, and creating our own is neither financially viable nor practical due to a lack of maintenance resources.

Whole Life Carbon Emissions

In compliance with the requirements outlined in the PfE, whole life carbon has been considered, as outlined earlier in this report.

9.0 Appendix A – Part L Compliance Report (with SAP results)

CWC

crookes walker
consulting





Palatine Road

Didsbury

Domestic Part L Compliance Report

Date: 01/06/2026
Ref: 3349-CWC-XX-XX-RP-N-7002-P01

Crookes Walker Consulting Limited is registered in England & Wales | 05011466 |
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Revision Record

Date	Reference	Revision	Prepared	Checked	Authorised
01/06/2026	3349-CWC-XX-XX-RP-N-7002-P01	01	Asiya Saud	Mohammad Elserraj	John Barnett
			AS	ME	JB

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1.0 Executive Summary

Crookes Walker Consulting (CWC) have undertaken SAP assessments to demonstrate Palatine Road, in Didsbury, Greater Manchester, achieves compliance with the following requirements:

- Approved Document L, Conservation of fuel and power, Volume 1: Dwellings 2021

The report details the assessments that have been carried out on all the dwellings within the development, which are outlined herein. Table 1 summarises the outcome of the assessment.

Block	EPC Rating				No. Dwellings Assessed
	A	B	C	D	
Block A	0	30	0	0	30
Block B	6	28	0	0	28
Block C	0	30	0	0	30

Table 1. Results Summary

1.1 Site Location

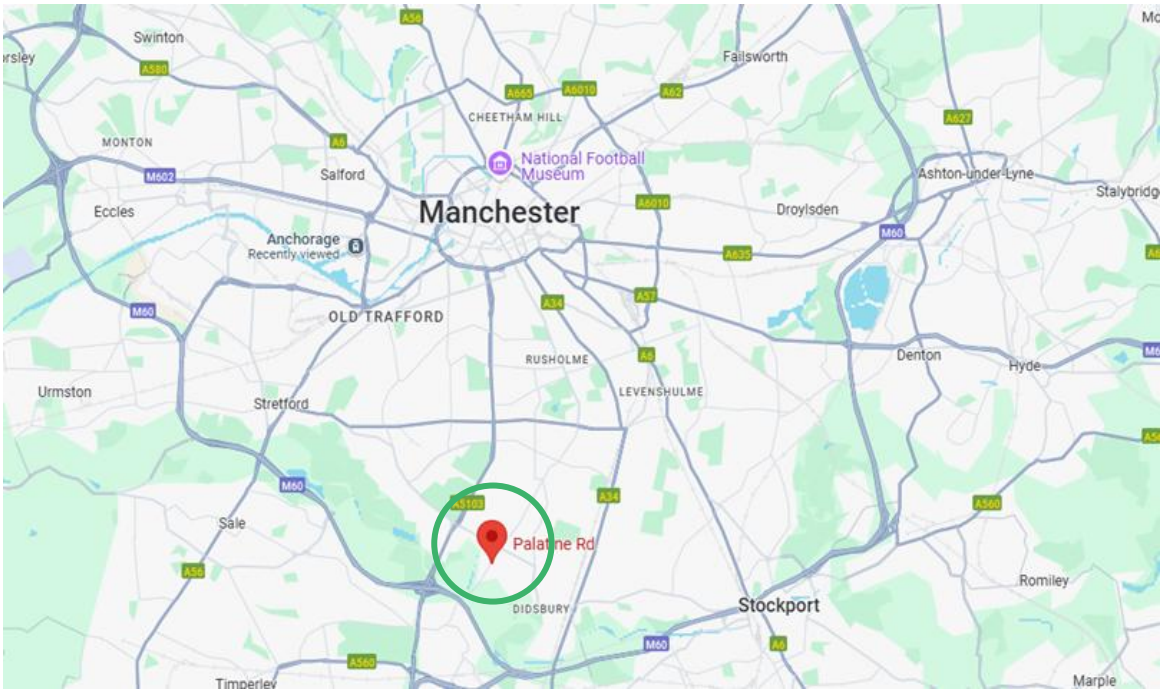


Figure 1. Site Location

The site is in Greater Manchester.

1.2 Modelling Disclaimer

The building has been modelled with accredited software SAP 10.2 which is approved for the purpose of demonstrating compliance with the energy efficiency and carbon emission requirements of the Building Regulations for domestic buildings.

These assessments were undertaken by an Energy Specialist; an individual who has acquired substantial expertise or a recognised qualification for undertaking assessments, designs and installations of Low and Zero Carbon solutions in the commercial buildings sector and is not professionally connected to a single Low and Zero Carbon technology or manufacturer.

It should be noted that the data generated by this work is obtained using computer calculations. These calculations are the best means of predicting the performance of the building at this stage. Full certainty can only be achieved by measuring the performance of the building and associated systems after a period of use.

Whilst the calculations have been undertaken in good faith using reasonable skill and care, Crookes Walker Consulting Limited can take no responsibility for differences between the computer calculations and the actual performance of the completed building due to the inherent complexity and variability of the physics in a building and its environment.

1.3 Building Layout

Table 2 Confirms the architectural drawings used for the SAP calculations.

Drawing	Drawing Ref.	Revision	Date
Level 00	1459-OMI-ZZ-00-DR-A-L1001-P04	04	11/05/2026
Level 01	1459-OMI-ZZ-00-DR-A-L1002-P04	04	
Level 02-03	1459-OMI-ZZ-00-DR-A-L1003-P04	04	
Level 04	1459-OMI-ZZ-00-DR-A-L1004-P04	04	
North Elevation	1459-OMI-ZZ-00-DR-A-L1600-P02	02	
East Elevation	1459-OMI-ZZ-00-DR-A-L1601-P02	02	
South Elevation	1459-OMI-ZZ-00-DR-A-L1602-P02	02	
West Elevation	1459-OMI-ZZ-00-DR-A-L1603-P02	02	
Site Section AA	1459-OMI-ZZ-00-DR-A-L1500-P02	02	
Site Section BB	1459-OMI-ZZ-00-DR-A-L1501-P02	02	
Site Section CC	1459-OMI-ZZ-00-DR-A-L1502-P02	02	

Table 2. Drawing Register

Figures 2 – 5 depict the layouts for Floors 0-4.



Figure 2. Level 0



Figure 3. Level 01

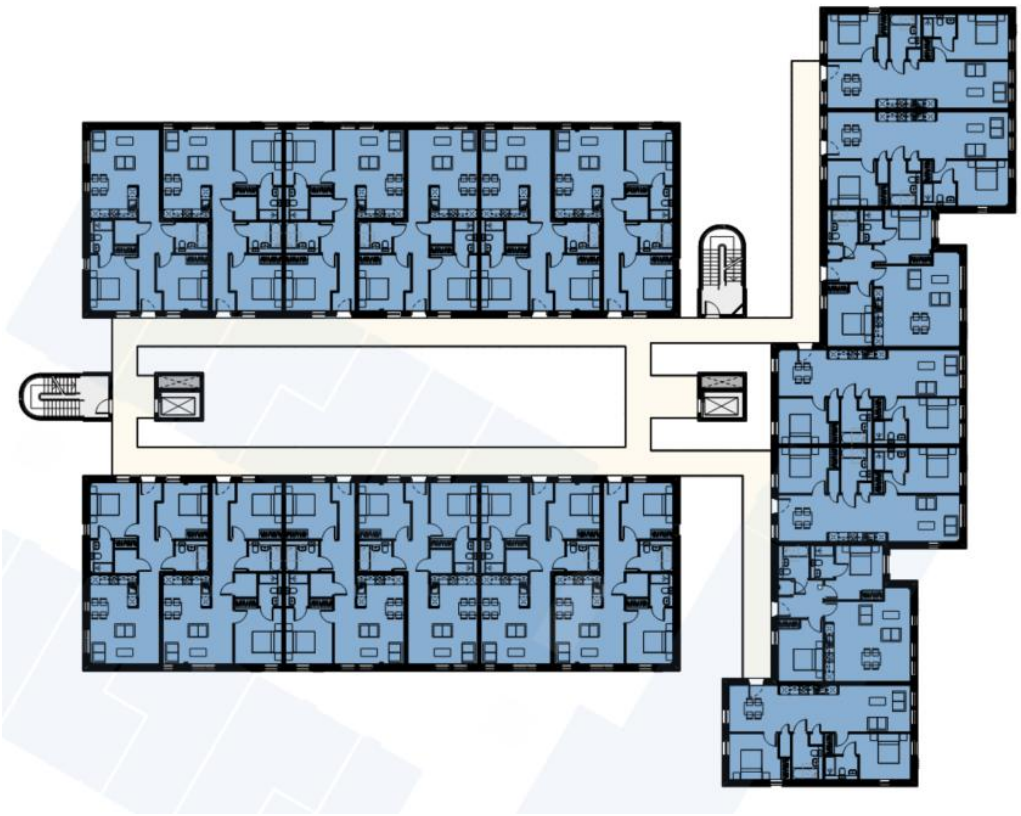


Figure 4. Level 02-03

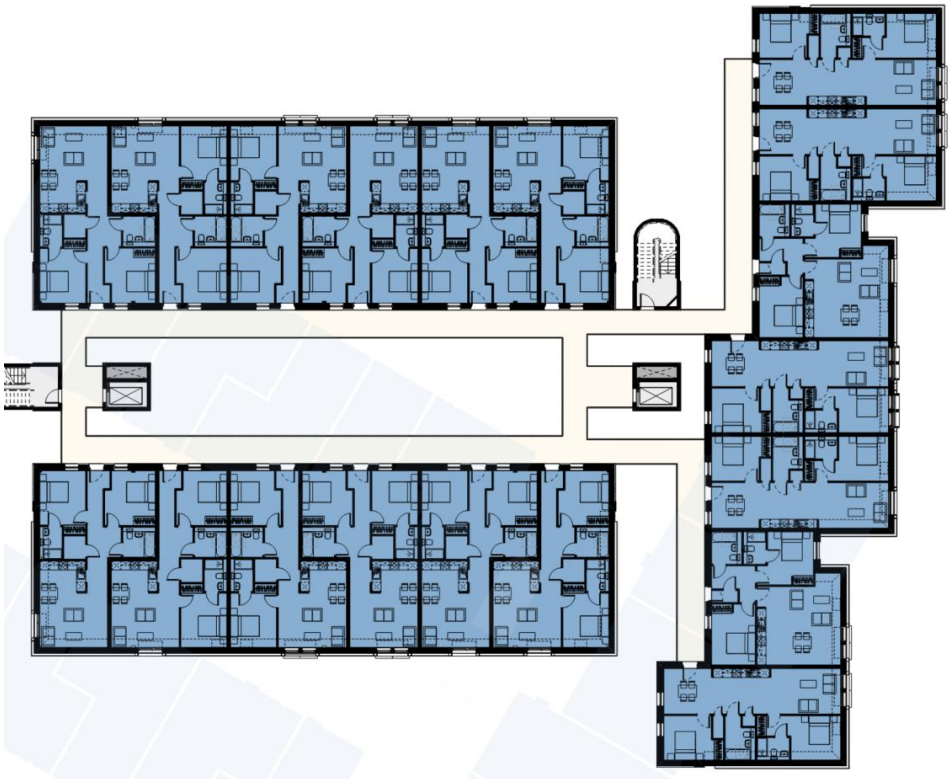


Figure 5. Level 04

2.0 Approved Document L: Conservation of Fuel and Power, Volume 1: Dwellings 2021

The English Building Regulations 2021 Part L, Volume 1 for new dwellings requires three criteria be met to achieve compliance in order to attain overall compliance. The focus of this assessment is:

- Criterion 1: Carbon dioxide emissions & fabric energy efficiency
- Criterion 2: Performance of the building fabric and the fixed building services.
- Criterion 3: Energy usage

To meet Criterion 1, the carbon dioxide emissions ($kgCO_2/m^2/year$) are noted as the Emission Rating, the Dwelling Emission Rating (DER), must be lower than or equal to the Target Emission Rating (TER). The DER is measured in kilogrammes of carbon dioxide per square per metre of floor area per year ($kgCO_2/m^2/year$).

To meet Criterion 2, the Dwelling Fabric Energy Efficiency (DFEE), must be lower than or equal to the Target Fabric Energy Efficiency (TFEE). The DFEE is measured in $kWh/m^2/year$.

To meet Criterion 3, the Dwelling Primary Energy Rate (DPER), must be lower than or equal to the Target Primary Energy Rate (TPER). The DPER is measured in kilowatt hours of primary energy per square metre (kWh_{PE}/m^2).

Each dwelling must meet the three criteria to achieve compliance with Approved Part L: Conservation of Fuel and Power, Volume 1: Dwellings 2021.

3.0 Input Parameters

3.1 Building Fabric

The fabric parameters assigned are stated below in Table 3 & 4.

Element	Proposed u-value ($W/m^2/K$)	Approved Document L (2021) Maximum u-value ($W/m^2/K$)
External Walls	0.12	0.26
Internal Wall	Fully Filled	
Ground Floor	0.12	0.18
Roof	0.12	0.16
Windows	1.20 G value 0.4	1.60

Table 3. Fabric Details

Proposed Design Value ($m^3/h/m^2$) @50 Pa)	AD L (2021) Maximum Allowable ($m^3/h/m^2$) @50 Pa
3	8

Table 4. Air Permeability

Table 5 displays the thermal bridging details used in the analysis (Psi values).

Bridge Type	Psi
E1 Steel Lintel with perforated steel base plate	0.05

Bridge Type	Psi
E3 Sill	0.05
E4 Jamb	0.03
E5 Ground Floor (Normal)	0.03
E7 Party floor between dwellings (blocks of flats)	0.03
E15 External Wall to Flat Roof with Parapet	0.10
E16 Corner (Normal)	0.05
E18 Party wall between dwellings	0.03
P3 Party Wall – Intermediate floor between dwellings (blocks of flats)	0.00

Table 5. Psi Values

3.2 System Details – to Achieve EPC Rating 'B'

System Details	
Mechanical Installation	Vent Axia Sentinel Econiq S (Inside heated envelope)
SFP	0.46 W/l/s
Ductwork	Rigid
Space Heating	Electric Panel Heater
Controls	Programmer, room thermostat and TRVs
Water Heating	Heat Pump KERS Wetherby

System Details	
WWHRS	N/A
Renewables	N/A
Lighting	120 lm/W

Table 6. System Details to Achieve EPC Rating 'B'

4.0 Summary

Crookes Walker Consulting (CWC) have undertaken SAP assessments to demonstrate Palatine Road, in Didsbury, Greater Manchester, achieves compliance with the following requirements:

- Approved Document L, Conservation of fuel and power, Volume 1: Dwellings 2021

The report details the assessments that have been carried out on all the dwellings within the development, which are outlined herein. Table 7 summarises the outcome of the assessment.

Block	EPC Rating				No. Dwellings Assessed
	A	B	C	D	
Block A	0	30	0	0	30
Block B	6	28	0	0	28
Block C	0	30	0	0	30

Table 7. Results Summary

EPC rating 'B' throughout may be achieved with the systems stated in Section 3.2. Detailed results for each block can be found in Appendix 1-3.

5.0 Appendix 1 – Block A

Assessment Reference	Sap Rating	DER	TER	%DER<TER	DPER	TPER	%DPER<TPER	DFEE	TFEE	%DFEE<TFEE
00.01.2B	85	4.06	15.46	73.74%	42.4	82.52	48.61%	31.47	44.83	29.80%
00.02.2B	87	3.41	13.18	74.13%	35.89	70.27	48.93%	26.58	34.37	22.68%
00.03.2B	88	3.33	13.08	74.54%	35.12	69.77	49.67%	25.94	33.88	23.43%
00.04.2B	88	3.26	12.92	74.77%	34.43	68.94	50.06%	25.26	33.13	23.73%
00.05.2B	88	3.33	13.01	74.40%	35.11	69.36	49.38%	25.85	33.56	22.97%
00.06.2B	85	4.18	15.75	73.46%	43.67	84.12	48.09%	32.06	46.11	30.47%
01.01.2B	88	3.32	12.79	74.04%	34.91	68.04	48.69%	25.55	32.86	22.25%
01.02.2B	90	2.63	10.85	75.76%	28.13	57.7	51.25%	19.58	23.76	17.60%
01.03.2B	90	2.76	11.07	75.07%	29.34	58.74	50.06%	21.09	25.06	15.85%
01.04.2B	90	2.63	10.79	75.63%	28.13	57.3	50.90%	19.52	23.53	17.02%
01.05.2B	90	2.59	10.7	75.79%	27.71	56.88	51.28%	18.89	22.99	17.82%
01.06.2B	88	3.23	12.75	74.67%	34.04	67.92	49.88%	24.85	32.53	23.60%
02.01.2B	88	3.32	12.79	74.04%	34.91	68.04	48.69%	25.55	32.86	22.25%
02.02.2B	90	2.63	10.85	75.76%	28.13	57.7	51.25%	19.58	23.76	17.60%
02.03.2B	90	2.76	11.07	75.07%	29.34	58.74	50.06%	21.09	25.06	15.85%
02.04.2B	90	2.63	10.79	75.63%	28.13	57.3	50.90%	19.52	23.53	17.02%
02.05.2B	90	2.59	10.7	75.79%	27.71	56.88	51.28%	18.89	22.99	17.82%
02.06.2B	88	3.29	12.83	74.36%	34.7	68.26	49.17%	25.42	32.94	22.81%
03.01.2B	88	3.32	12.79	74.04%	34.91	68.04	48.69%	25.55	32.86	22.25%
03.02.2B	90	2.74	11.04	75.18%	29.21	58.59	50.14%	20.94	24.87	15.80%
03.03.2B	90	2.76	11.07	75.07%	29.34	58.74	50.06%	21.09	25.06	15.85%
03.04.2B	90	2.63	10.79	75.63%	28.13	57.3	50.90%	19.52	23.53	17.02%
03.05.2B	90	2.59	10.7	75.79%	27.71	56.88	51.28%	18.89	22.99	17.82%
03.06.2B	88	3.29	12.83	74.36%	34.7	68.26	49.17%	25.42	32.94	22.81%

Assessment Reference	Sap Rating	DER	TER	%DER<TER	DPER	TPER	%DPER<TPER	DFEE	TFEE	%DFEE<TFEE
04.01.2B	87	3.68	13.69	73.12%	38.65	72.97	47.03%	28.03	36.67	23.57%
04.02.2B	86	3.88	13.82	71.92%	40.62	73.51	44.74%	30.32	37.58	19.30%
04.03.2B	87	3.55	13.5	73.70%	37.26	71.95	48.21%	27.59	35.85	23.05%
04.04.2B	87	3.59	13.47	73.35%	37.68	71.76	47.49%	27.85	35.82	22.24%
04.05.2B	87	3.75	13.64	72.51%	39.33	72.59	45.81%	29.14	36.75	20.71%
04.06.2B	83	4.7	16.68	71.82%	48.94	88.92	44.97%	35.99	50.51	28.74%

6.0 Appendix 2 – Block B

Assessment Reference	Sap Rating	DER	TER	%DER<TER	DPER	TPER	%DPER<TPER	DFEE	TFEE	%DFEE<TFEE
00.02.4B_TH	82	4.25	12.97	67.23%	44.01	68.72	35.96%	36.84	45.68	19.34%
00.03.4B_TH	82	4.26	12.34	65.48%	44.04	65.25	32.50%	36.27	42.96	15.57%
00.05.4B_TH	82	4.27	12.95	67.03%	44.21	68.57	35.52%	36.93	45.62	19.05%
00.06.4B_TH	83	4.02	11.91	66.25%	41.62	62.89	33.82%	34.92	40.96	14.75%
00.07.4B_TH	81	4.69	13.39	64.97%	48.38	70.84	31.70%	38.95	47.78	18.49%
01.01.2B	87	3.82	13.1	70.84%	39.9	69.61	42.68%	27.82	34.35	19.02%
01.04.2B	90	2.39	9.6	75.10%	25.63	50.88	49.63%	14.4	17.72	18.74%
02.01.2B	88	3.55	12.74	72.14%	37.19	67.54	44.93%	27	33.25	18.81%
02.02.2B	89	2.89	11.23	74.27%	30.65	59.52	48.51%	21.62	25.95	16.69%
02.03.2B	89	3.03	11.49	73.63%	32.06	60.84	47.30%	22.83	27.33	16.48%
02.04.2B	90	2.77	10.61	73.89%	29.41	56.12	47.59%	20.21	23.26	13.09%
02.05.2B	89	2.89	11.21	74.22%	30.62	59.43	48.47%	21.6	25.87	16.51%
02.06.2B	89	2.96	11.4	74.04%	31.38	60.41	48.06%	22.16	26.77	17.22%
02.07.2B	88	3.37	12.33	72.67%	35.41	65.35	45.82%	25.31	31.33	19.21%
03.01.2B	88	3.55	12.74	72.14%	37.19	67.54	44.93%	27	33.25	18.81%
03.02.2B	89	2.89	11.23	74.27%	30.65	59.52	48.51%	21.62	25.95	16.69%

Assessment Reference	Sap Rating	DER	TER	%DER<TER	DPER	TPER	%DPER<TPER	DFEE	TFEE	%DFEE<TFEE
03.03.2B	89	3.03	11.49	73.63%	32.06	60.84	47.30%	22.83	27.33	16.48%
03.04.2B	90	2.77	10.61	73.89%	29.41	56.12	47.59%	20.21	23.26	13.09%
03.05.2B	89	2.89	11.21	74.22%	30.62	59.43	48.47%	21.6	25.87	16.51%
03.06.2B	89	2.96	11.4	74.04%	31.38	60.41	48.06%	22.16	26.77	17.22%
03.07.2B	88	3.37	12.33	72.67%	35.41	65.35	45.82%	25.31	31.33	19.21%
04.01.2B	83	4.68	17.23	72.84%	48.79	92.02	46.98%	35.53	52.81	32.71%
04.02.2B	86	3.94	14.56	72.94%	41.2	77.5	46.84%	30.17	40.92	26.28%
04.03.2B	86	4.1	15.07	72.79%	42.82	80.22	46.62%	31.31	43.28	27.66%
04.04.2B	87	3.72	13.27	71.97%	38.97	70.45	44.68%	28.27	35.32	19.97%
04.05.2B	87	3.83	13.89	72.43%	40.03	73.89	45.82%	29.33	37.81	22.43%
04.06.2B	86	4.07	14.93	72.74%	42.47	79.45	46.54%	30.96	42.69	27.49%
04.07.2B	84	4.48	16.48	72.82%	46.66	87.84	46.88%	33.74	49.55	31.90%

7.0 Appendix 3 – Block C

Assessment Reference	Sap Rating	DER	TER	%DER<TER	DPER	TPER	%DPER<TPER	DFEE	TFEE	%DFEE<TFEE
00.01.2B	85	4.01	15.74	74.52%	41.93	84	50.08%	31.25	46.1	32.20%
00.02.2B	88	3.25	12.75	74.51%	34.32	67.96	49.50%	24.99	32.36	22.79%
00.03.2B	88	3.21	12.72	74.76%	33.85	67.86	50.12%	24.62	32.21	23.55%
00.04.2B	88	3.24	12.86	74.81%	34.21	68.61	50.14%	25.03	32.83	23.75%
00.05.2B	88	3.28	12.87	74.51%	34.59	68.59	49.57%	25.32	32.89	23.02%
00.06.2B	86	3.98	15.29	73.97%	41.64	81.63	48.99%	30.38	43.99	30.93%
01.01.2B	88	3.41	13.05	73.87%	35.89	69.43	48.31%	26.48	34.04	22.20%
01.02.2B	90	2.54	10.39	75.55%	27.22	55.19	50.68%	17.75	21.47	17.33%
01.03.2B	90	2.59	10.38	75.05%	27.69	55.04	49.70%	18.4	21.74	15.34%

Assessment Reference	Sap Rating	DER	TER	%DER<TER	DPER	TPER	%DPER<TPER	DFEE	TFEE	%DFEE<TFEE
01.04.2B	90	2.57	10.47	75.45%	27.48	55.58	50.56%	18.28	21.97	16.82%
01.05.2B	90	2.55	10.48	75.67%	27.3	55.68	50.97%	18.02	21.9	17.70%
01.06.2B	89	3.04	12.21	75.10%	32.2	65	50.46%	22.87	30.01	23.79%
02.01.2B	88	3.41	13.05	73.87%	35.89	69.43	48.31%	26.48	34.04	22.20%
02.02.2B	90	2.54	10.39	75.55%	27.22	55.19	50.68%	17.75	21.47	17.33%
02.03.2B	90	2.59	10.38	75.05%	27.69	55.04	49.70%	18.4	21.74	15.34%
02.04.2B	90	2.57	10.47	75.45%	27.48	55.58	50.56%	18.28	21.97	16.82%
02.05.2B	90	2.55	10.48	75.67%	27.3	55.68	50.97%	18.02	21.9	17.70%
02.06.2B	89	3.07	12.19	74.82%	32.48	64.83	49.89%	23.09	29.98	22.99%
03.01.2B	88	3.41	13.05	73.87%	35.89	69.43	48.31%	26.48	34.04	22.20%
03.02.2B	90	2.59	10.38	75.05%	27.66	55.06	49.75%	18.37	21.7	15.31%
03.03.2B	90	2.59	10.38	75.05%	27.69	55.04	49.70%	18.4	21.74	15.34%
03.04.2B	90	2.57	10.47	75.45%	27.48	55.58	50.56%	18.28	21.97	16.82%
03.05.2B	90	2.55	10.48	75.67%	27.3	55.68	50.97%	18.02	21.9	17.70%
03.06.2B	89	3.07	12.19	74.82%	32.48	64.83	49.89%	23.09	29.98	22.99%
04.01.2B	86	4.03	14.18	71.58%	42.11	75.5	44.23%	30.76	39.16	21.44%
04.02.2B	87	3.57	12.97	72.47%	37.47	68.93	45.65%	27.51	33.66	18.29%
04.03.2B	88	3.36	13	74.15%	35.36	69.26	48.94%	25.74	33.52	23.22%
04.04.2B	88	3.45	13.11	73.68%	36.26	69.8	48.05%	26.5	34.12	22.33%
04.05.2B	88	3.53	13.07	72.99%	37.02	69.51	46.74%	27.03	34.12	20.77%
04.06.2B	85	4.29	15.77	72.80%	44.71	84.02	46.79%	32.71	46.37	29.46%

8.0 Appendix 4 – SAP Credentials

Name of assessor: Eleanor Schofield
Design SAP 2012 Software: Elmhurst Energy Systems Ltd 4.14r19
Assessor number: U281-0001