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One Castlefield

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 in consideration of the proposed residential development at One Castlefield.

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 at One Castlefield consists of two blocks with apartments and townhouses, aimed at delivering high-quality, sustainable housing. 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 minimize 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.
- Energy Forecast: An Energy Forecast has been prepared in accordance with CIBSE TM54.
- 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, One Castlefield, located in 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 Proposed Site Overview

The site, located adjacent to the A57 Chester Road and approximately 1.1 miles from Manchester city centre, is strategically positioned within the established Castlefield/St. George's area. It is well-connected, benefiting from proximity to Bridgewater Canal, mainline railway, tramway and Cornbrook Metrolink Station.

The proposed development comprises two residential blocks. Block A comprises of ground and first floors plus 44 storeys of residential units, while Block B is a ground floor plus 8-storey building comprising a mix of townhouses and apartments. Together, the development delivers high-quality residential accommodation supported by sustainable design principles and measures to minimise environmental impact.

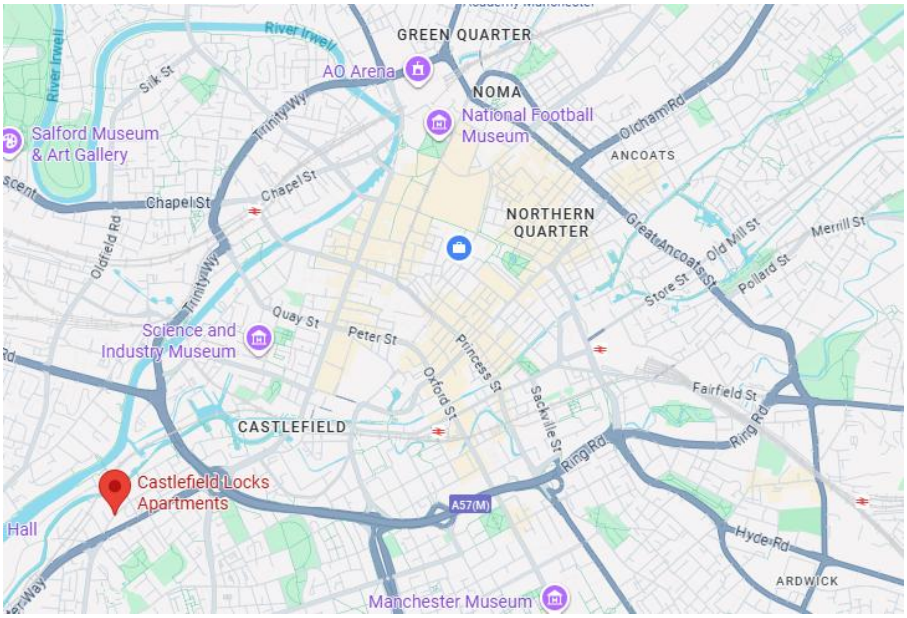


Figure 1 – Site Location

The proposed site location postcode is M15 4QQ.

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, Places for Everyone and In-line with the GMCA Design Guidance for Net Zero 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 is considered.

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

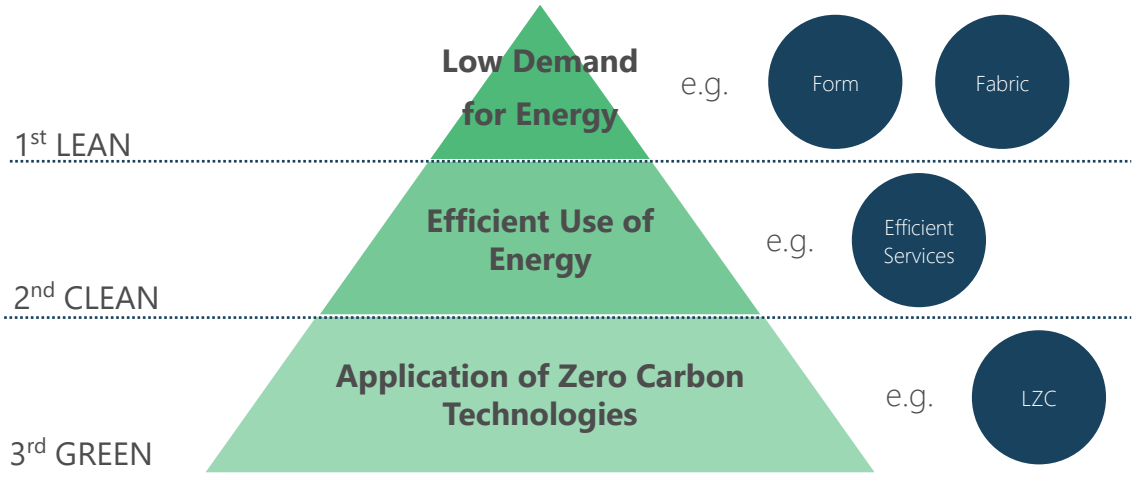


Figure 2 - Energy Hierarchy Diagram

3.2 Additional Project Sustainability Objectives

One Castlefield 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.

3.2.1 Energy Performance Certificate Rating of 'B'

Both residential blocks are designed to achieve a minimum of 80% EPC rating B across all dwellings. SAP and EPC assessments have been undertaken to demonstrate compliance, with further assessments to be completed during subsequent design stages as the design progresses. The proposed energy strategy incorporates a high-performance building fabric (as detailed in Section 4.0 of this report), air source heat pump technology for domestic hot water generation, and other energy efficiency measures outlined within this report. The SAP and EPC assessment results for the development are provided in Appendix 1.

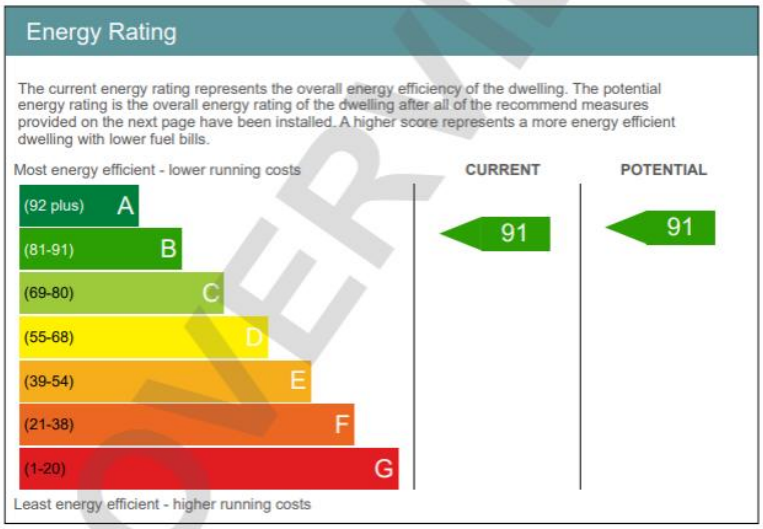


Figure 4 - Example "As Designed" EPC Result for typical apartment within proposed development

3.2.2 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.
One Castlefield has been designed at planning stage in a manner that a Home Quality Mark (HQM) rating could be achieved.

4.0 Energy Conservation ("Be Lean")

This section provides an overview of the current strategy for designing One Castlefield 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.

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

Element	Minimum Fabric Values (Building Regulations Part L)	Proposed Project Fabric Target
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	1.1 W/m^{2}K g-value 0.40
Roof	0.16 W/m^{2}K	0.11 W/m^{2}K
Ground/ Exposed Floor	0.18 W/m^{2}K	0.11 W/m^{2}K
Thermal Bridging	n/a	Enhanced
Air permeability	8 m^3/hr/m^2 @ 50 Pa	3 m^3/hr/m^2 @ 50 Pa

Table 1 – Regulatory Minima & Proposed U-values

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 TM59. This assesses the risk of overheating is acceptable and that the scheme does not rely on the need for mechanical cooling, which is energy intensive.

The fabrics noted above along with suitable window openings to outside have resulted in an acceptable risk of overheating.

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.

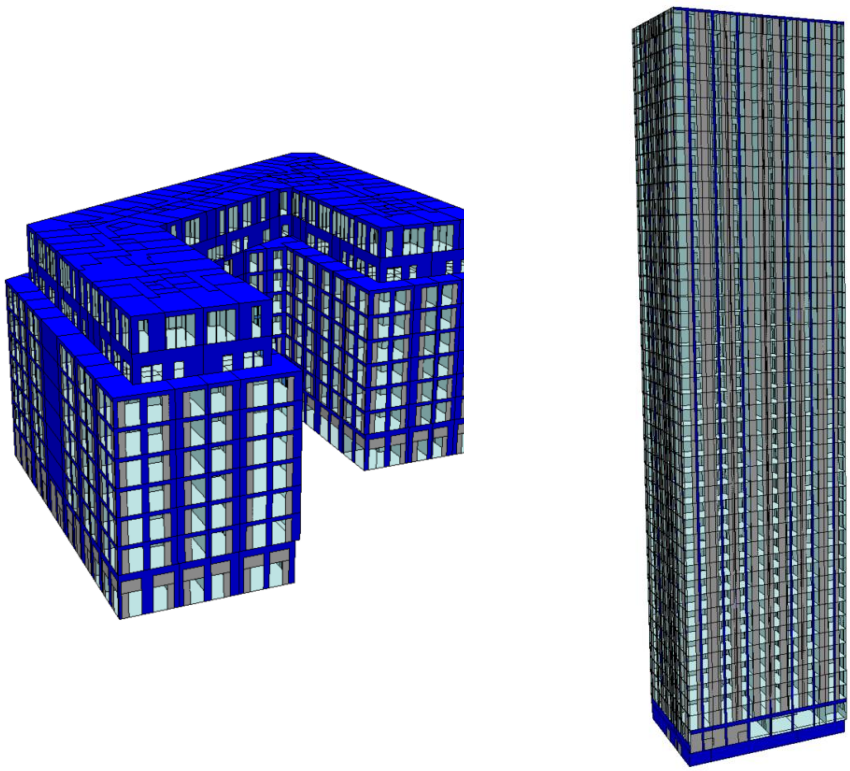


Figure 5 - Views of Dynamic Thermal Model

5.0 Energy Efficient Operation ("Be Clean")

In-line with the GMCA Design Guidance for Net Zero framework for net zero carbon buildings, the strategy for the One Castlefield 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 by Figure 5 below.

One Castlefield looks to achieve the principles set out within the 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.

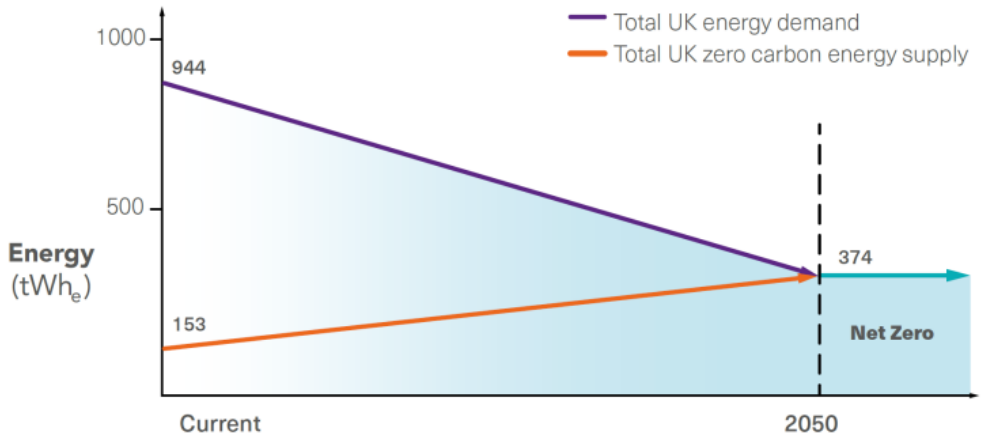


Figure 5 – Minimising Demand & Cleaning the Grid to Achieve Net Zero

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 to be delivered 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 an 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 smart phones. Applications 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 heaters 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 recognise when a window is open 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

The proposed dwelling ventilation strategy comprises individual exhaust-air to water heat pumps incorporating mechanical extract ventilation. The system recovers heat from the extract air to generate domestic hot water while providing continuous mechanical ventilation in accordance with Approved Document F. This approach reduces operational energy demand and carbon emissions compared with conventional direct electric hot water systems.

With the MVHR unit, around 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.

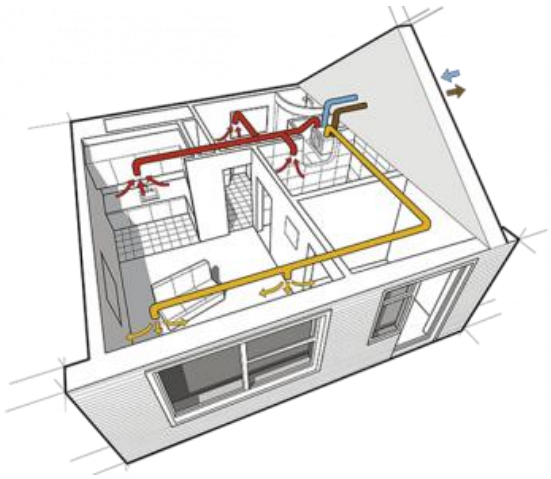


Figure 7 - Example of MVHR System (Image Courtesy of Xpelair)

5.3 Intelligent Lighting

Low energy LED luminaires are proposed throughout the scheme for landlord areas, apartments and dwellings.

All landlord areas, except for 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 metered and made easily accessible.

5.6 EV Charging

EV charging proposes 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 One Castlefield residential development includes conveniently located parking spaces on the ground floor at the front of the apartment blocks, 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 following summarises potential solutions for use within each dwelling.

6.1 Air to Water Heat Pump Technology

The 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.



Figure 9 - Air to Water Heat Pump

A system of this type is around three times more energy (and carbon) efficient than a traditional direct electric unvented cylinder.

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.

The proposed ASHP system will provide domestic hot water only. Space heating throughout the apartments will be provided via direct electric panel heaters. This approach simplifies the heating distribution network whilst maintaining a fully electric building services strategy.

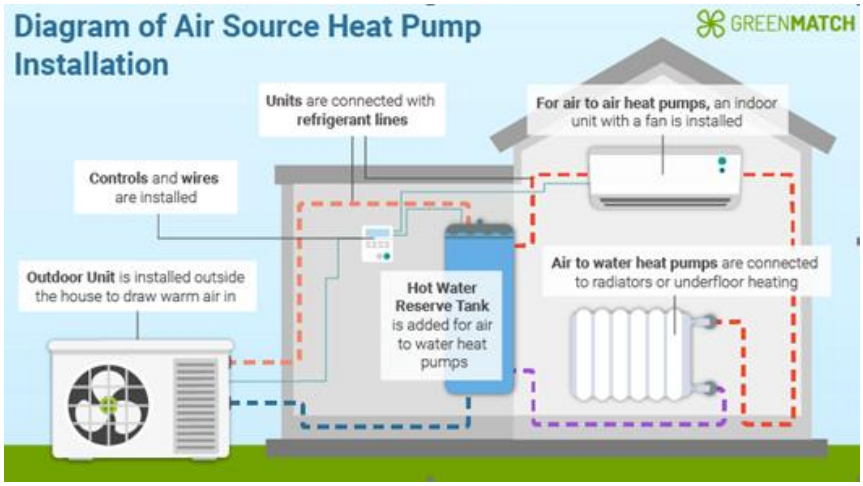


Figure 10 – ASHP Installation

6.2 Solar Photovoltaics (PV)

All apartments and dwellings and internal landlord spaces are heated via electric equipment (i.e. electrical panel radiators 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 also aligns with the sustainability goals highlighted in Places for Everyone (PfE) framework. PV has been incorporated into the development reflecting a commitment to environmental responsibility as shown in figure Refer to appendix A for the SAP results.

6.3 Waste Water Heat Recovery

A Wastewater Heat Recovery (WWHR) device could be incorporated to pre-heat the water supply to showers and baths by recuperating heat from outgoing wastewater via a robust heat exchanger). An example of a WRAS approved WWHR device is given in Figure 13.



Figure 13 –Wastewater 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.
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 8.1.3

6.5 Whole Life Carbon Considerations

A Whole Life Carbon Assessment (WLCA) has been undertaken for One Castlefield at the current planning stage in accordance with the GMCA Design Guidance for Net Zero Carbon Developments. The assessment considers embodied carbon associated with the structural, architectural and building services elements of the development and has informed key design decisions throughout the project.

The structural design has focused on reducing embodied carbon through optimisation of the structural grid, minimising slab thickness, incorporating cement replacement within the concrete specification where practicable, and eliminating piled foundations to Block A using the underlying sandstone bedrock.

The architectural design adopts lean design principles through efficient façade design, optimised window-to-wall ratios, repeatable façade components and material-efficient construction systems to reduce material consumption whilst maintaining the required building performance.

The building services design has sought to minimise embodied carbon through rationalised plant selection and distribution routes, reducing the quantity of installed materials where practicable, together with the specification of refrigerants with low Global Warming Potential (GWP).

The completed Whole Life Carbon Assessment demonstrates that embodied carbon has been considered as an integral part of the design process and will continue to inform the development as the design progresses through subsequent project stages.

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 Council's Core Policy guidance as is applicable to One Castlefield.

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 using 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) 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.

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

Table 12.1 – Domestic CO_2 emissions reduction targets

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

This report demonstrates how compliance is achieved with the statutory requirements as noted within Section 7.1 above.

Utilising the approved SAP 10.2 software, representative samples of apartments and houses have been assessed, typically on an area-weighted block average of the sample.

The predicted energy and CO_2 emissions for the residential accommodation have been calculated for a variety of solutions as can be seen within Appendix A.

The solutions which were deemed as a 'Pass' under the SAP 10.2 software indicate that the 'dwelling emission rate' achieved around a 50% betterment over the minimum 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) Enhanced fabric solutions - E.g. triple glazing
b) Solar photovoltaics

c) Air to water heat pumps e. Mechanical Ventilation with Heat Recovery
d) 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 GMCA (Greater Manchester Combined Authority) has established interim targets that define net zero carbon standards for new builds today. These targets align with the GMCA Design Guidance for Net Zero 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.



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.

	Space Heat Demand	Hot Water Energy Demand	Renewable Energy Generation Targets
2025 - Onwards	Houses (20kWh/m^2/Yr) Flats (15kWh/m^2/Yr)	20% energy demand reduction in the total heat required for water heating	*Photovoltaic installation: 40% ground floorspace

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

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 in Sections 8.1.1 and 8.1.2.

The One Castlefield 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.

2025-Onwards				
Space Heating Demand (kWh/m^2/Yr)		Hot Water Energy Demand (Note 2)	Renewable Energy Generation	
PfE Target	Performance Achieved (Note 1)		PfE Target	Performance Achieved
Houses: 20 Flats: 15	Houses: 17 Flats: 7	20% energy demand reduction in the total heat required for water heating	Photovoltaic installation: 40% ground floorspace	PV covers 40% Ground floor Space

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

Note 1: Demonstrates the highest result of one house and one apartment achieving compliance the remaining dwellings successfully achieved a space heating demand below the target threshold too.

Note 2: All calculations undertaken have achieved this requirement.

EV Chargers

The proposed EV chargers for the One Castlefield residential development, as detailed in Section 5.6, 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 – SAP Assessment Report

Energy Strategy Option	Space Heating Strategy	Domestic Hot Water Strategy	Vent System Type	PV Requirement	SAP Compliance Results		
				kWp	DFEE< TFEE	DPER< TPER	DER< TER
Block A							
3582 One Castlefield							
Block A	elec panel	HW HP	KERS MEV	none	10%	43%	69%
Block B							
3582 1 One Castlefield							
Block B	elec panel	HW HP	KERS MEV	15.7	14%	34%	66%