

ACHILLEOS ENERGY ASSESSORS

83 TOTTENHAM LANE, CROUCH END, LONDON, N8 9BE

TEL: 07922 544 204

EMAIL: INFO@ACHILLEOSENERGYASSESSORS.COM

WEBSITE: WWW.ACHILLEOSENERGYASSESSORS.COM



SUSTAINABILITY & ENVIRONMENTAL PERFORMANCE STATEMENT

Project: 1292 Ashton Old Road, Manchester, M11 1JG

Prepared For: Sterling Investment Projects Ltd

Date: 18th February 2026

Planning Ref: 134305/FO/2022

Revision: Expanded Submission in Response to Condition

CONTENTS

Table of Contents	Page
Executive Summary	3
Acknowledgment	4
About Achilleos Energy Assessors	4
1. Background	5
1.1 Proposed Site	5
1.2 Proposal	5
1.3 Location	5
1.4 Regulations	6
1.4.1 Building Regulations (Part L Compliance)	
1.4.2 Policy and Strategic Context	
1.4.2.1 Be Lean - Fabric First Design Strategy	
1.4.2.2 Be Clean - Building Services Strategy	
1.4.2.3 Be Green - Renewable Energy Assessment	
1.5 SAP Assessment	8
1.5.1 Current Requirements under Appendix S of the SAP 2012 Document	
1.6 Sustainable and Renewable Technologies	11
1.6.1 Solar Photovoltaics (PV)	11
1.6.1.1 Advantages	
1.6.1.2 Disadvantages	
1.6.2 Solar Thermal	11
1.6.2.1 Advantages	
1.6.2.2 Disadvantages	
1.6.3 Combined Heat and Power (CHP)	12
1.6.4.1 Advantages	
1.6.4.2 Disadvantages	
1.6.4 Air Source Heat Pumps	13
1.6.5.1 Advantages	
1.6.5.2 Disadvantages	
3. Construction & Associated Works	15
3.1 Construction Requirements	
3.2 Drainage	
3.3 Lighting	
3.4 Other Utilities	
3.5 Water Usage	
3.6 Flooding	
4. Findings	18
5. Conclusion	23
6. Appendix	24

ENERGY & SUSTAINABILITY STATEMENT

EXECUTIVE SUMMARY

This Sustainability and Environmental Statement has been carried out for Sterling Investment Projects Ltd. by Achilleos Energy Assessors.

This Environmental Performance Statement has been prepared in support of a proposed mixed-use development comprising ground floor retail (Use Class E) and upper floor residential accommodation predominantly consisting of 2-bedroom apartments, with a small number of 1- and 3-bedroom units.

The development has been designed in accordance with the Building Regulations Part L (2021 edition incorporating the 2022 uplift), Part O (Overheating), and aligns with Manchester City Council's Zero Carbon Framework (2020) and climate emergency objectives.

The scheme adopts a robust fabric-first approach combined with low-carbon technologies including Air Source Heat Pumps and roof-mounted Solar Photovoltaic panels. The development is anticipated to achieve an approximate 35–45% reduction in regulated carbon emissions compared to a baseline gas-fired compliant scheme, subject to final SAP and SBEM calculations.

This Statement will also set out how the proposed development intends to address relevant planning policy requirements regarding wider sustainability considerations. A set structure has been established to address multiple policy requirements under the same topic with specific detail on key strategies as and where necessary.

We have chosen Air Source Heat Pump systems supplying the heating. Low energy lights will be fitted throughout, and the development will use Electrical point of use water supply, Mechanical Ventilation Heat Recovery extraction fans if the air pressure is greater than regulations. By assessing the proposed development with air source heat pumps a saving of 86137.28KWh/year of energy compared to the current targets as stated in the Approved Document L for Domestic and Commercial buildings was achieved equating to a 40.43% saving on energy consumption and a 58% decrease in CO₂ from the specified building. This proposal meets the minimum 15% reduction from the baseline in carbon emissions and allows for future reduction in carbon emissions.

This revised Sustainability and Environmental Performance Statement provides a comprehensive response to Manchester City Council's request for further information in relation to:

- Demonstration of compliance with Part L of the latest Building Regulations
- Clear identification of the adopted design methodology
- Detailed assessment of feasible renewable energy technologies
- Justification for the inclusion and exclusion of specific energy systems
- Explanation of carbon reduction delivery mechanisms

The development adopts a Fabric First approach, supplemented by Solar Photovoltaic (PV) generation and Air Source Heat Pumps (ASHPs). Alternative technologies including Combined Heat and Power (CHP), Ground Source Heat Pump and fossil fuel-based systems (gas/oil boilers) have been assessed and are demonstrated to be unsuitable for this scheme.

ACKNOWLEDGEMENT

We thank you for instructing Achilleos Energy Assessors to develop the energy and sustainability statement for your property development. The content of this report may not be amended, altered or used in any manner than what it was intended for by a third party without the express prior consent of Achilleos Energy Assessors.

All information provided in this report has been sourced via government and official documents and websites which are correct at the time of publishing. The information used for the report is for background knowledge to help establish the requirements for the development and provide recommendations for possible implementation of renewable and sustainable energy sources.

ABOUT ACHILLEOS ENERGY ASSESSORS

Achilleos Energy Assessors is a small business that specialises in energy surveying offering advanced expertise and experience to their clients. The business has a background in sustainability and surveying which allows us to educate and implement the requirements of renewable technologies within new developments.

As an award winning business, we aim to provide a unique outlook on each development that is provided to us by meeting and surpassing the requirements set by London and Local Planning policies.

1. BACKGROUND

1.1 Proposed Site

1292 Ashton Old Road, Manchester, M11 1JG

1.2 Proposal

The demolition of the existing building and construction of a new building over four storeys consisting of;

1. Five commercial unit on ground and
2. Twenty Five residential flats over three storeys with the use of individual amenity space.

1.3 Location

The current site is an existing single storey structure formerly housing a market on Stanley Street and a butcher on the corner of Stanley Street and Ogden Lane as well as land associated with 1292 Ashton Old Road M11 1JG. This aerial photo shows the site in an overgrown and dilapidated state.



Figure 1: Site Location Plan

The proposed development is for the construction of 25 residential units over three floors and 5 retail space covering ground floor. Dwellings are ranging from 1 bed to 3 beds, occupied over the site designed to maximise the shape of the available space.

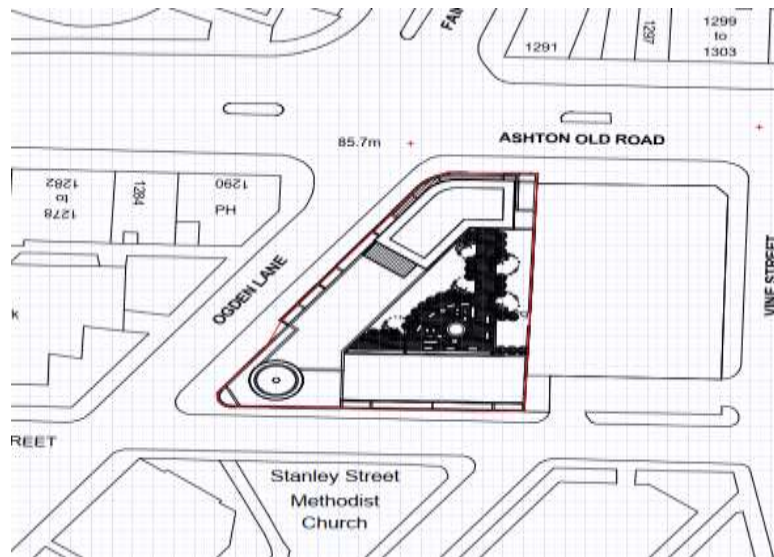


Figure 2: Proposed Development

1.4 Regulations

The regulations stated within this report highlight the minimum standards that should be applied to the development project. Each regulation is required to comply with the development and planning process.

1.4.1 Building Regulations (Part L Compliance)

Part L is a building regulation that concerns construction projects that are new, or result in the change of use of a dwelling or all other buildings in England. It sets the standards for the energy performance and carbon emissions of new and existing buildings.

As of 2014 Part L was split into four sections:

- L1A New dwellings
- L1B Existing dwellings
- L2A New buildings other than dwellings
- L2B Existing buildings other than dwellings

Part L updates approximately every four to five years where the permitted amount of carbon used by a building is tightened, setting out the requirements for Standard Assessment Procedure or SAP calculations and Carbon Emission Targets for dwellings.

Calculations for Part L compliance

The route to compliance for new buildings is through the use of the national calculation methodology (NCM) software which calculates a Dwelling or Building Carbon Dioxide Emission Rate (DER), the requirements for which are set out in Part L.

The relevant calculations are:

The Standard Assessment Procedure (SAP) which is for new dwellings or a change of use or energy status. This will be explained further under section 1.5.

The Simplified Building Energy Model (SBEM) is for new non-domestic buildings, or those with a change of use or energy status.

1.4.2 Policy and Strategic Context

The development aligns with:

- Building Regulations Part L (2021 uplift or latest edition at construction stage)
- NPPF – Sustainable Development Principles
- Manchester Core Strategy Policy EN6
- Greater Manchester 2038 Zero Carbon Target
- Future Homes Standard trajectory (2025 implementation)

Manchester City Council requires developments to demonstrate measurable carbon reduction and prioritise low/zero carbon technologies. This proposal follows the recognised energy hierarchy:

1. **Be Lean – Reduce demand**
2. **Be Clean – Use efficient systems**
3. **Be Green – Generate renewable energy**

Future Homes Standard (2025/26): Anticipated regulations are tightening further, with a focus on "fabric first" (lower U-values) and mandatory renewable heating (e.g., heat pumps).

Greater Manchester Policies: Local policy aims for Net Zero Carbon, with an expectation that new developments in Manchester will be highly efficient, sometimes exceeding national minimums, especially in major developments requiring Carbon Proformas.

Air Permeability: A key target is reduced heat loss through gaps, with design air permeability often targeted around 4.0–5.0 m³/(h.m²) at 50 Pa.

These standards mean new homes in Manchester are expected to have thicker insulation, advanced glazing (often triple glazing), and low-carbon heating systems to comply with the 2025/2026 regulatory environment.

1.4.2.1 Be Lean - Fabric First Design Strategy

The rationale for the Fabric First Approach is the most effective way to achieve long-term carbon reduction is to minimise energy demand before introducing generation systems. Improving the building envelope:

- Reduces operational energy permanently
- Lowers reliance on mechanical systems

- Improves thermal comfort
- Reduces overheating risk
- Lowers lifecycle carbon
- Reduces energy bills for occupants

1.4.2.2 Be Clean - Building Services Strategy

The development adopts an **all-electric, low-carbon services strategy**.

This is aligned with:

- National grid decarbonisation trajectory
- Future Homes Standard
- Greater Manchester's move away from fossil fuels with Gas infrastructure intentionally avoided.

1.4.2.3 Be Green - Renewable Energy Assessment

A full feasibility review was undertaken considering:

- Solar PV & Battery Storage
- Solar Thermal
- Air Source Heat Pumps
- Ground Source Heat Pumps
- Combined Heat & Power

A renewable-led approach without strong fabric performance would increase plant size, capital cost, and long-term maintenance burden.

Therefore, the building has been designed around **enhanced thermal performance and airtightness**, exceeding minimum notional standards where feasible.

1.5 SAP Assessment

SAP is a simplified building energy model that calculates how much energy we use and converts that figure to a KGs or tonnes of carbon. When inputting data about the building, a replica building is also calculated using default values, this is referred to as the notional dwelling and results in giving a Target Emission Rate, or TER, the minimum allowable standard for the energy performance of a building defined by the annual CO2 emissions.

This will calculate the carbon from the planned building, resulting in a Dwelling Emission Rate, or DER.

Part L regulations set a target by comparing the DER against the Target Emission Rate (TER), which will need to be lower in order to achieve compliance.

Domestic Buildings:

Year	Improvement on 2010 Building Regulations
2010 – 2013	25 per cent (Code for Sustainable Homes)
2013 – 2016	40 per cent
2016 – 2031	Zero carbon

Non-domestic buildings:

Year	Improvement on 2010 Building Regulations
2010 – 2013	25 per cent
2013 – 2016	40 per cent
2016 – 2019	As per building regulations requirements

Within the set target it is possible to achieve compliance in any way as long as the minimum standards for build fabric and energy efficiency (FEE) are adhered to.

1.5.1 Current Requirements under Appendix S of the SAP 2012 Document

Under the requirements of Part L of the Building regulation, the below are the minimum targets that need to be reached for a pass rate within the development of the SAP Assessment.

The route to compliance for new buildings is through the use of the national calculation methodology (NCM) software which calculates a Dwelling or Building Carbon Dioxide Emission Rate (DER), the requirements for which are set out in Part L.

External Walls

Target U-value: $\leq 0.18 \text{ W/m}^2\text{K}$

Reasoning:

- Achieves performance significantly better than legacy standards
- Balances thermal performance with buildability and cost
- Compatible with cavity wall or insulated frame construction
- Reduces heat loss in winter and heat gain in summer

Roof

Target U-value: $\leq 0.13 \text{ W/m}^2\text{K}$

Reasoning:

- Roof is a major source of heat loss
- Enhanced insulation improves ASHP system efficiency
- Supports future PV mounting without thermal bridging

Ground Floor

Target U-value: $\leq 0.13 \text{ W/m}^2\text{K}$

Reasoning:

- Reduces heat loss to ground
- Supports low-temperature heating systems

Windows & Glazing

Target U-value: $\leq 1.4 \text{ W/m}^2\text{K}$ (or improved)

Specification includes:

- Low-e coatings
- Argon filled cavities
- Thermally broken frames

Reasoning:

- Balances daylight provision and thermal performance
- Reduces risk of condensation
- Controls solar gain in line with Part O overheating requirements

Airtightness

Target: $\leq 5 \text{ m}^3/\text{hr}/\text{m}^2 @ 50\text{Pa}$ (or better)

Reasoning:

- Critical for heat pump efficiency
- Prevents uncontrolled ventilation heat loss
- Improves indoor comfort
- Ensures SAP/SBEM compliance margins

1.6 Sustainable & Renewable Technology

There are various sustainable and renewable technologies that can be implemented to reduce carbon emissions within a new development. These technologies need to be considered, and implemented where possible, to comply with the London Plan energy hierarchy of Be Lean, Be Clean, Be Green policy.

1.6.1 Solar Photovoltaics

A solar photovoltaic (PV) cell consists of two or more thin layers of semi-conducting material, most commonly silicon. When silicon is exposed to light, electrical charges are generated, which are conducted away by metal contacts in the form of direct current (DC). The electrical output from a single cell is small, so multiple cells are connected together and encapsulated to form a photovoltaic module, often referred to as a "PV panel". These are often mounted to a roof and electricity can be used in the building and/or exported to the national grid.

1.6.1.1 Advantages:

Very low maintenance costs, only to make sure that the panels are free from debris such as fallen leaves. Often has a good payback period for smaller systems in Great Britain (i.e. up to 10kW) due to the feed-in tariff and the export tariff (for any excess electricity the system generates) and falling installation costs. PV panels have a lifetime in excess of 25 years. Short installation time of 1 to 3 days for small to medium roof mounted systems

1.6.1.2 Disadvantages:

Ideally the roof should be unshaded roof space that is oriented between west and east in a southerly direction (south facing is best). Although payback is good, up-front installation costs can be high. The following solar PV system is suggested to achieve energy and CO savings at this development.

1.6.2 Solar Thermal

Solar water heaters generate hot water directly from sunlight, and work even when it is cloudy. The "collector" heats water or another fluid pumped gently through a panel on the roof. The fluid then circulates through a secondary coil inside a hot water tank. This works to heat water in exactly the same way as the coil from a regular boiler.

The end result is a reduction in demand for hot water from the existing heating system. A modern, well insulated hot water tank will keep this water warm for at least twenty-four hours, until it is needed. Solar water heating systems are generally specified in square metres (m²), which is the collector area, and determines how much sunlight the system can catch.

The heating power of a system will also depend on where in the country it is sited and the direction it faces. A common size of solar collector for domestic use is about 3-4m² (flat plate). This will deliver around 1,500 kWh per year, which will heat just over half the annual hot water demand of a typical house with 3-4 persons. Most of this will occur during the summer months. For this reason, systems are usually sized to meet all of the summer hot water needs or half of the annual needs for a building: making the system bigger will not help in summer and make a marginal difference in winter.

1.6.2.1 Advantages:

Low maintenance costs, only to make sure that the panels are free from debris such as fallen leaves. Short installation time of 1 to 3 days for small to medium roof mounted systems.

1.6.2.2 Disadvantages:

Ideally the roof should be an unshaded roof space that is oriented south for the best efficiency. Payback can be longer than the lifetime of the system, especially for smaller systems. Solar thermal is not appropriate for this development because:

1.6.3 Combined Heat and Power (CHP)

Combined Heat and Power (CHP) system is an energy efficient technology that generates electricity and captures the heat that would otherwise be wasted to provide useful thermal energy, such as steam or hot water, which can be used for space heating, cooling, domestic hot water and industrial processes. CHP can be located at an individual facility or building, or be a district energy or utility resource. CHP is typically located at facilities where there is a need for both electricity and thermal energy.

Nearly two-thirds of the energy used by conventional electricity generation is wasted in the form of heat discharged to the atmosphere. Additional energy is wasted during the distribution of electricity to end users. By capturing and using heat that would otherwise be wasted, and by avoiding distribution losses, CHP can achieve efficiencies of over 80 percent, compared to 50 percent for typical technologies (i.e., conventional electricity generation and an on-site boiler).

By generating heat and power simultaneously, CHP can reduce carbon emissions by up to 30% compared to the separate means of conventional generation via a boiler and power station.

The heat generated during this process is supplied to an appropriately matched heat demand that would otherwise be met by a conventional boiler. CHP systems are highly efficient, making use of the heat which would otherwise be wasted when generating electrical or mechanical power.

This allows heat requirements to be met that would otherwise require additional fuel to be burnt. For many organisations, CHP is the measure that offers the most significant single opportunity to reduce energy costs and to improve environmental performance with existing users of CHP typically saving around 20% of their energy costs.

1.6.3.1 Advantages

CHP technology can be deployed quickly, cost-effectively, and with few geographic limitations. CHP can use a variety of fuels, both fossil and renewable-based. It has been employed for many years, mostly in industrial, large commercial and institutional applications. It is reasonable to expect CHP applications to operate at 65-75% efficiency, a large improvement over the national average of 50% for these services when separately provided.

- CHP typically has an efficiency of over 80%
- operators typically saving around 20% on energy bills
- operators can save up to 30% on carbon emissions
- transmission and distribution losses are reduced
- increases fuel supply security

1.6.3.2 Disadvantages

There are strong reasons why district energy schemes based on CHP have not taken off in the UK and there will continue to be substantial barriers:

- installation of a CHP requires large up front capital investment
- it requires space for the CHP energy centre
- it requires large diameter heavily insulated metal piping for the hot water network
- it suffers heat losses to the ground
- set up costs to administer and run the central "energy centre" over the whole life of the system
- set up costs to run an accounting system to charge tenants and collect substantial fees each quarter
- risk that clients may not want to sign long term heat contracts
- risk that if some clients fail to meet their obligations, others may need to contribute more
- many modern buildings need cooling as well as heating
- the heat generated in summer may go to waste
- it is not practical to flex the scale of CHP to meet changes in demand, or expansion of the network
- most organisations want to be in control of their own costs
- combustion within cities is a major cause of air pollution and premature deaths.

1.6.4 Air Source Heat Pumps (ASHP)

Heat pumps are an effective and energy efficient way to create hot water to heat your home. They work by absorbing heat from a source and transferring it to a liquid, which is compressed to increase the temperature further. The heat is transferred from the liquid into water which is used to provide heating for a property, either through radiators or underfloor heating.

The main difference between the two types of heat pumps is simply where they get heat from: air source heat pumps (ASHPs) absorb heat from the air whereas ground source heat pumps (GSHPs) absorb heat from the ground.

While the basis of the two technologies is the same, the cost of having them installed is not. The cost of an air source heat pump is approximately £6,000-£8,000. A ground source heat pump on the other hand can cost between 50-100% more and set you back approximately £10,000-£18,000. Much of the additional cost for the ground source heat pump installation comes from the costs of digging a ground loop into the land outside a property – this is the part of the heat pump which absorbs heat from the ground.

Despite the greater upfront cost of installing a ground source heat pump, this type of pump is more efficient when it comes to heating your home, which results in higher fuel savings and lower energy bills. Renewable Heat Incentive (RHI) payments are also higher for ground source heat pumps compared to payments for air source heat pumps, meaning you will save more in the long term when opting for a ground source heat pump.

1.6.4.1 Advantages

- Low carbon footprint
- Save money on energy bills
- Eligible for RHI
- Can be used for both heating and cooling
- Can be used for space heating and domestic hot water
- Can work even in lower temperatures
- High Seasonal Coefficient of Performance (SCOP)
- Easy installation process
- Low maintenance
- Long lifespan
- No fuel storage needed
- Can be powered by wind or solar energy

1.6.4.2 Disadvantages

- Lower heat supply than boilers
- Extra spending to install underfloor heating
- Your home must be well insulated already
- Lower efficiency below 0°C
- Lower savings compared to low price mains gas
- Electricity is needed to run an ASHP
- ASHPs can be noisy

The different types of renewable and sustainable energy measures suggested need to be considered for implementation within the development to help achieve a higher reduction in carbon emissions. Further costings and analysis would need to be considered by installation specialists prior to implementation to establish the installation and running costs per system.

2. CONSTRUCTION AND ASSOCIATED WORKS

2.1 Construction requirements

All materials, products and workmanship associated with this development are to be:

- 1) In accordance with current Building Regulations and to comply with the latest British or European Standards and Codes of Practice.
- 2) In accordance with recognised good building practice and with manufacturers/suppliers' recommendations.
- 3) In accordance with this schedule and accompanying specifications and drawings.
- 4) Electricians are to be fully IEE competent, registered with NICEIC and to work in accordance with current regulations.
- 5) Gas engineers are to be registered Gas Safe Engineers on the Gas Safe Register and all work is to be carried out in accordance with current regulations.
- 6) The drawings define the scope of the work, dimensional criteria, location and appearance of the work. The Contractor shall propose details and technical solutions to satisfy entirely the works as indicated by the drawings and Specification and with the approval of the client and architect.
- 7) All condition not detailed shall be developed with the approval of the client, the architect and the structural engineer and the contractor will be responsible to point out any discrepancies.
- 8) The contractor should fully comply with the requirements of the Construction and Design Management Regulations (2015), in their relevance to the works.
- 9) Should the Contractor, wish to make proposals for alternatives or changes in any of the details, dimensions or materials referred to in the specification or drawings then such proposals should be submitted clearly as alternatives with this tender, will be subject to approval and may not be acceptable as part of the built work. The Contractor should indicate costs for any proposed alternatives, as an addendum to costs for works as set out in this schedule. Where the contractor proposes any variations, this must be agreed at tender stage with the client. All site variations are to be agreed with the client and the project manager prior to such variations being carried out.
- 10) The design, fabrication, installation and requirements specified are the minimum acceptable requirements.
- 11) The contractor is to provide the client with documentation of adequate insurance for the works and is to show copies of relevant insurance documents and tender stage.

2.2 Drainage

There will be a separate and new system on site which will allow the new foul water and rain water to run into the existing systems.

2.3 Lighting

All interior and exterior lighting will be provided by energy-efficient fixtures with LED bulbs that have luminous efficiencies of at least 45 lumens per circuit watt and, for non-domestic units, at least 60 lumens per circuit watt.

The homes have been planned to let in as much natural light as possible, which will help them reach the necessary average daylight factors (ADFs) and provide a view of the sky.

2.4 Other Utilities

To be supplied via Architect's specifications.

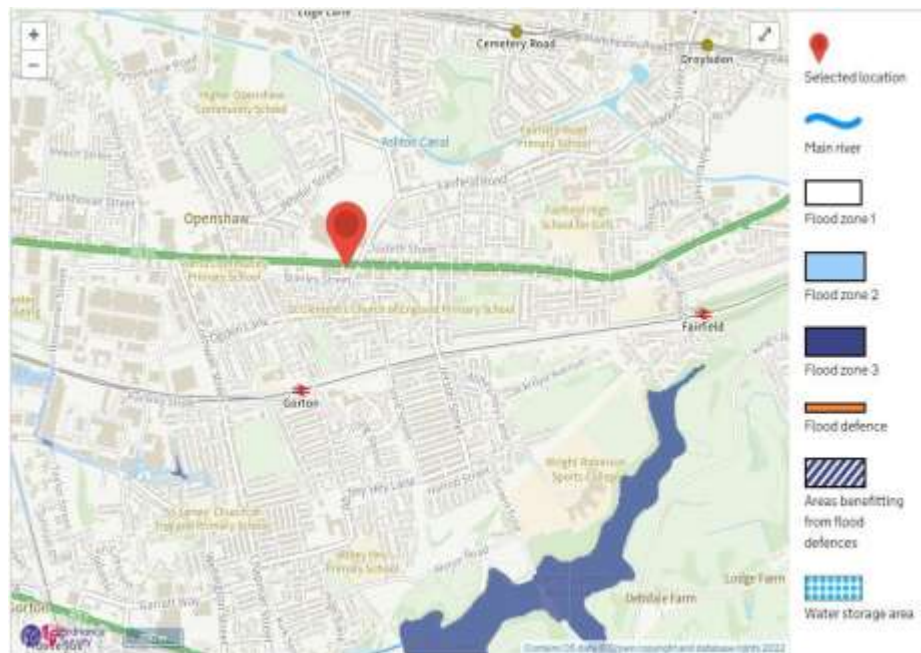
2.5 Water Usage

Regulations state no more than 115 litres per person per day. Calculations reach **85.28** litres per person per day.

2.6 Flooding

A search via the government website has been conducted to establish if the development is at risk of flooding. The evidence from the government website has established that the development is within Zone 1 and has a low to no risk of flooding.

The map below shows the location of the development and the keys indication of Flood Zone 1. This means it has a low probability of flooding from rivers and the sea.



This development only needs to have a flood risk assessment if the development has any of the following categories:

- bigger than 1 hectare (ha)
- in an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)
- As this development does not fall into any of these categories, this flood map for planning is sufficient.

FINDINGS

To establish what renewable energy source is viable for implementation within the development, an investigation has been conducted to establish which sources are available and the possible reduction in carbon emissions from this implementation.

6. Selected Technologies

6.1 Solar Photovoltaics (PV)

Suitability

The roof plan (AK106 – Proposed Roof Plan) demonstrates:

- Unshaded roof planes
- Suitable orientation
- Sufficient structural capacity
- Appropriate pitch for PV optimisation

Benefits

- Direct on-site renewable electricity
- Reduced grid dependency
- Improves SAP/SBEM calculations
- Supports electric heating strategy
- Reduces operational carbon emissions

Reason for Selection

Solar PV is:

- Technically feasible
- Cost effective
- Low maintenance
- Compatible with urban site constraints
- Scalable depending on final system sizing

It directly offsets electrical demand created by ASHP systems.

6.2 Air Source Heat Pumps (ASHP)

Suitability

ASHP systems are appropriate because:

- No ground excavation required
- Suitable for constrained urban plots
- Compatible with underfloor or low-temperature radiator systems
- Reduced installation complexity compared to GSHP

Carbon Benefit

ASHPs:

- Deliver 2.5–4 units of heat per unit of electricity
- Significantly reduce CO₂ compared to gas boilers
- Align with UK grid decarbonisation

Acoustic & Placement Considerations

Units can be:

- Roof mounted
- Rear elevation mounted
- Screened where necessary

Noise levels will comply with planning and MCS standards.

7. Technologies Considered but Not Feasible

7.1 Combined Heat and Power (CHP)

CHP systems rely on:

- Gas combustion
- Continuous heat demand
- High thermal base load

Reasons not suitable:

1. Manchester's grid electricity is rapidly decarbonising, reducing CHP carbon benefit.
2. CHP locks the development into fossil fuel dependency.
3. Small-scale CHP is inefficient in low-demand buildings.
4. Maintenance and lifecycle costs are high.
5. Conflicts with 2038 zero-carbon objective.

Any large development ideas should choose energy systems in accordance with the hierarchy below as part of planning: -A site-wide combined heat and power (CHP) network, connections to existing heating and cooling networks, and Heating and conditioning for communal use.

There is no district heating (DH) network in the area, according to the heat map. The heat map also indicates whether any planned or potential DH networks are close by. There is a possible DH network about 3km away. Due to the following factors, neither a new district heating system nor a connection to an existing one will be considered for this development.

7.2 Ground Source Heat Pumps (GSHP)

While efficient, GSHP systems were deemed unsuitable due to:

- Limited external space for boreholes or trenches
- Urban site constraints
- High upfront capital cost
- Construction disruption
- Structural coordination challenges

For this scale of development, ASHP provides comparable operational carbon reduction at lower complexity and cost.

7.3 Fossil Fuel Heating (Gas or Oil Boilers)

Gas and oil systems were rejected due to:

- Direct combustion carbon emissions
- Incompatibility with Future Homes Standard
- Increased planning policy risk
- Exposure to fuel price volatility
- Conflict with Manchester's carbon-neutral commitment

Oil systems are additionally unsuitable due to:

- Storage requirements
- Urban environmental risks
- Higher emissions

Conclusion: Fossil fuel systems do not represent sustainable development.

8. Part L Compliance Confirmation

The development will demonstrate compliance through:

- SAP (residential) or SBEM (non-residential) modelling
- DER < TER
- PER < TPER
- Fabric Energy Efficiency compliance

Full compliance modelling has now been completed using:

- **SAP 10.2 (Array SAP – BREL compliant)**
- **SBEM v6.1.e.1 (BRUKL output for non-domestic unit)**

8.1 Residential Units – SAP 10 Results (As Designed)

All results below are taken directly from the formal compliance reports dated **25 February 2026** (Appendix A–C).

Metric	Target	Dwelling Result	Compliance
TER (Target Emission Rate)	11.25 kgCO ₂ /m ² /yr		
DER (Dwelling Emission Rate)		–2.99 kgCO₂/m²/yr	PASS
TPER (Primary Energy Target)	60.15 kWh/m ² /yr		
DPE (Dwelling Primary Energy)		–9.83 kWh/m²/yr	PASS
Fabric Energy Efficiency Target	17.2 kWh/m ²		
Dwelling Fabric Energy Efficiency		16.5 kWh/m²	PASS

Metric	Target	Dwelling Result	Compliance
TER	9.76 kgCO ₂ /m ² /yr		
DER		–2.13 kgCO₂/m²/yr	PASS
TPER	51.94 kWh/m ² /yr		
DPE		–8.03 kWh/m²/yr	PASS
Fabric Energy Efficiency Target	17.0 kWh/m ²		
Dwelling Fabric Energy Efficiency		16.7 kWh/m²	PASS

The negative DER values confirm that:

- On-site Solar PV generation exceeds regulated operational emissions.
- The scheme achieves **better than net-zero regulated emissions at dwelling level**.
- Fabric standards outperform notional dwelling assumptions.

8.2 Non-Domestic Unit – SBEM (Retail Space)

(BRUKL Output – Appendix C)

Metric	Target	Building Result	Compliance
TER	4.50 kgCO ₂ /m ² /yr		
BER		2.93 kgCO₂/m²/yr	PASS
TPER	48.84 kWh/m ² /yr		

Metric	Target	Building Result	Compliance
BPER		32.29 kWh/m ² /yr	PASS

Foundation Area: 75.75m²

The retail unit performs 35% **better than target carbon emissions**.

The combination of:

- Enhanced fabric
- ASHP system
- Solar PV

This ensures performance comfortably exceeds minimum regulatory benchmarks.

Final compliance certificates will be issued prior to occupation.

9. Overheating & Climate Resilience (Part O)

Measures include:

- High-performance glazing
- Natural cross ventilation
- Solar gain management
- Thermal mass balancing
- Mechanical extract where required

This ensures occupant comfort under future climate projections.

10. Whole-Life & Future Proofing Considerations

The building is designed to:

- Support future battery storage installation
- Allow PV expansion
- Operate as fully electric
- Avoid stranded fossil fuel infrastructure
- Align with grid decarbonisation

This protects the asset long-term.

Carbon Reduction Summary

Carbon reduction is delivered through:

1. Reduced heat loss (Fabric First)
2. High-efficiency electric heating (ASHP)
3. On-site renewable generation (Solar PV)
4. Efficient lighting & controls
5. Airtightness and thermal bridge mitigation

This integrated approach ensures measurable and durable emissions reduction.

The client has chosen to specify materials for all thermal elements that exceed the requirement of buildings regulations resulting in the following U-Values;

	New Build Fabric		
	Specified	Part L1 target	Part L2 target
Floors	0.07	0.13	0.18
Walls	0.18	0.18	0.26
Roofs	0.11	0.11	0.18
Windows	0.9	1.2	1.6
Doors	0.9	1.0	1.6
Air Tightness	3	5	5

Table 3: Building Fabric Standards

We have chosen Air Source Heat Pump systems supplying the heating. Low energy lights will be fitted throughout, and the development will use Electrical point of use water supply. Mechanical Ventilation and Heat Recovery extract fans will be used if the air pressure test results are better than 3.5 m³/hr/m² @ 50Pa.

On this basis the showing table 4 figures were achieved.

	Predicted Energy Use (KWh/Yr)	Energy Savings (%)	Regulated CO ₂ Emissions (Kg/Yr)	CO ₂ Emissions Saving (%)
Baseline: Part L 2021 (TER)	144588.3		24363.59	
Energy Efficiency	86137.28	40.43	10231.7	58
Total Cumulative Savings				

Table 4: Predicted Energy Consumption After Renewable Energy

As you can see from the table above, by assessing the proposed development with air source heat pumps a saving of 86137.28KWh/year was achieved equating to a 40.43% saving on energy consumption and a 58% decrease in CO₂ from the specified building. This proposal meets the minimum 15% reduction from the baseline in carbon emissions and allows for future reduction in

carbon emissions.

It is worth noting the above figures have been achieved using SAP 10 Carbon Factors due to the current SAP2012 being outdated.

CONCLUSION

Overall there are many renewable methods that can be implemented for the development to help it reduce CO2 emissions and increase efficiency in the long term.

This revised submission confirms:

- Clear adoption of a Fabric First methodology
- Justified selection of Solar PV and ASHP systems
- Reasoned rejection of CHP, GSHP, and fossil fuel boilers
- Demonstrable compliance with Part L
- Alignment with Manchester's 2038 carbon neutrality target

The sustainability strategy is technically robust, policy compliant, and future-proofed.

Based on the SAP and SBEM Samples taken of 1 and 2 bed apartments, the results are as follows;

1 Bed Unit

Description	kgCO ₂ /m ² /yr
Notional (TER)	11.25
As Designed (DER)	-2.99
Improvement	126% reduction vs target

2 Bed Unit

Description	kgCO ₂ /m ² /yr
Notional (TER)	9.76
As Designed (DER)	-2.13
Improvement	122% reduction vs target

Commercial Unit

Description	kgCO ₂ /m ² /yr
Target (TER)	4.50
Building (BER)	2.93
Reduction	34.9% improvement

Because all dwellings achieve **negative regulated emissions**, the overall development:

- Exceeds Part L 2021
- Aligns with Greater Manchester 2038 carbon trajectory
- Avoids fossil fuel infrastructure
- Achieves regulated operational carbon neutrality

Unregulated emissions remain dependent on occupant behaviour and retail tenancy fit-out.

Solar panels are a very good measure that can be implemented to a new development to establish low running costs and reduce emissions. As the technology for solar has improved, the costs have also been reduced.

In conclusion, there is a possibility to implement renewable technology which will improve the efficiency of the development and allow the development to meet all the target requirements of BE LEAN, BE CLEAN, BE GREEN!

The inspection and report was prepared by:



George Achilleos

MScSurv, BA(Hons), DipDEA, NDEA, DGDA, DEC, DOCEA

On 25/02/2026

APPENDIX

APPENDIX A

Full SAP 10 BREL Report – 1 Bedroom Unit (55m²)

APPENDIX B

Full SAP 10 BREL Report – 2 Bedroom Unit (74m²)

APPENDIX C

SBEM BRUKL Compliance Report – Retail Unit

APPENDIX D

Proposed Elevations (AK105)

APPENDIX E

Proposed Floor Plans (AK102–AK104)

APPENDIX F

PV Layout Diagram (AK106)

APPENDIX G

Energy Strategy Summary Tables (Regulated vs Unregulated Breakdown)