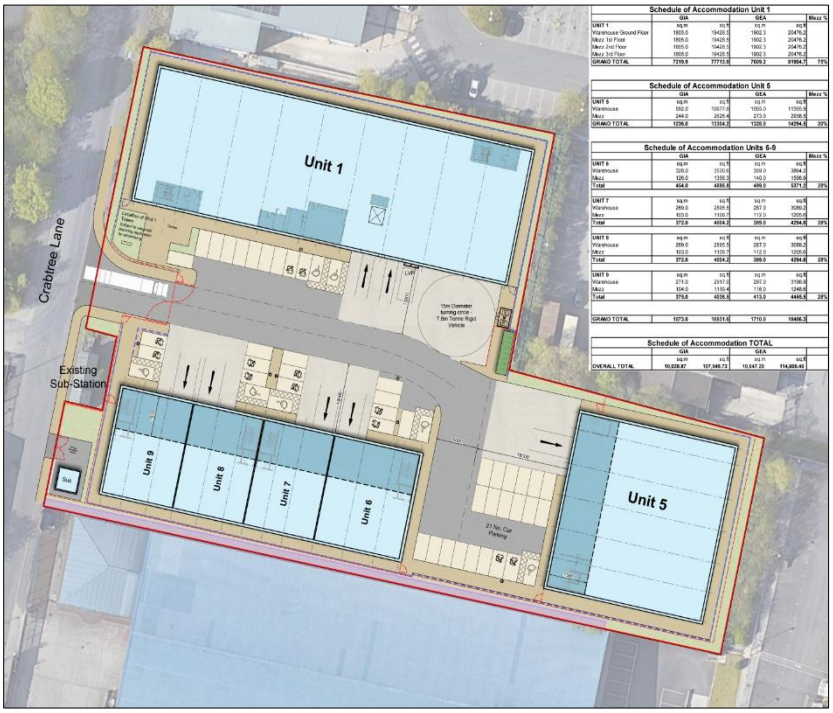
Crabtree Lane, Manchester

Client – Chancerygate Manchester Limited

Energy and Sustainability Statement



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RECORD OF REVISIONS.		
Date.	**Revision.**	**Description of change.**
30/11/2023	1	First Issue
11/12/2023	2	Updated to Incorporate Comments
18/12/2023	3	Updated Site Plan
23/08/2024	4	Updated Calculations
15/10/2024	5	Updated to Incorporate Comments
16/10/2024	6	Updated Site Plan

1 EXECUTIVE SUMMARY

This document has been prepared as part of the supporting documentation for a Section 73 planning application for the variation of conditions on existing planning permission 138914/FO/2023. Full planning permission was granted on 17 April 2024 for 'Erection of 9 no. units (in 3 no. buildings) with access and servicing arrangements, car parking, landscaping and associated works (Use Classes E(g) (iii) B2 and B8) following demolition of existing buildings and structures'. The majority of the proposed development remains identical to that approved under planning permission 138914/FO/2023, but changes have been made to enable units 1 – 4 to be merged and create a single unit.

The recommended sustainability features for the development resulting from a dynamic energy model, will allow for an 32.32% energy saving from a base Part L 2021 compliant build. A 30.24% reduction in carbon emission is anticipated through the incorporation of Air Source Heat Pumps and a 178 kWp Photovoltaic (PV) array, which will be located on the roof of the development. The sustainability features used will allow for a 4.92 tonnes reduction in annual CO2 emissions. The energy and carbon savings are to be achieved through passive design, energy efficient measures incorporating design features such as energy efficient lighting, submetering of relevant areas, upgrading of 'U' values and occupancy sensing in relative areas, as well as the incorporation of PV array and Air Source Heat Pumps. To reduce the energy demand of the development as well as help to conserve water resources within the local area, it is anticipated that the fit-out works will provide for sanitary fittings which will be water efficient through measures such as dual flush toilets and low flow taps.

The development is located within Manchester, and as such is in proximity to a range of primary local amenities such as a retail shops, a hotel and food outlets, as well as being in walking distance of public transportation systems.

The incorporation of these sustainability measures allows for the proposed development to be deemed sustainable and shall be in accordance with local and national policy.

2 INTRODUCTION

This document has been prepared as part of the supporting documentation for a Section 73 planning application for the variation of conditions on existing planning permission 138914/FO/2023. Full planning permission was granted on 17 April 2024 for 'Erection of 9 no. units (in 3 no. buildings) with access and servicing arrangements, car parking, landscaping and associated works (Use Classes E(g) (iii) B2 and B8) following demolition of existing buildings and structures'. Amendments have been made to the scheme and this Section 73 application seeks variation to conditions attached to the existing planning permission to enable variations to the proposed layout. The majority of the proposed development remains identical to that approved under planning permission 138914/FO/2023, but changes have been made to enable units 1 – 4 to be merged and create a single unit along the northern boundary which is to be occupied by a single operator.

Government policies now require significant energy reductions from proposed buildings. Building a greener future sets a planned trajectory outlined via Part L 2021 of the Building Regulations. These commitments have been the key focus point in addressing policies and strategies to reduce energy use and carbon emissions through energy efficiency and low or zero carbon technologies (LZC).

The recommended strategy takes into consideration the site layout and requirements for the building to produce a design that incorporates the most appropriate technologies available to the site that are commercially viable, whilst targeting compliance with all policies applicable to this development.

The proposed development in Manchester consists of 6 Industrial units as shown below in figure 1.

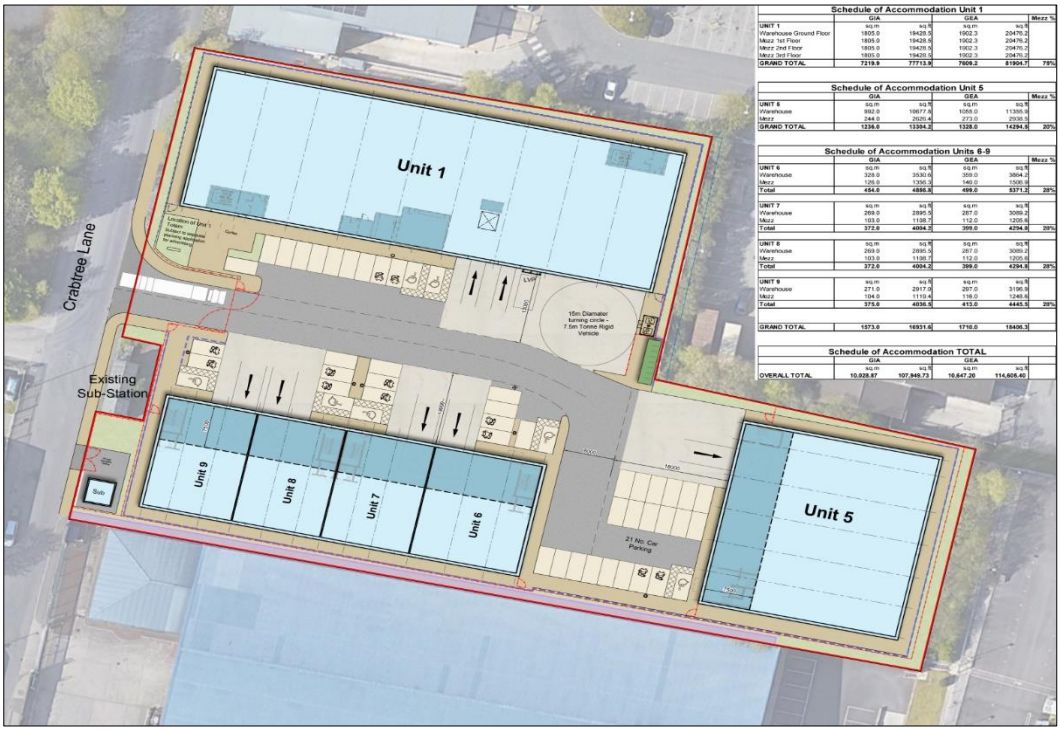


Figure 1: Proposed Site Plan

3 DRIVERS OF SUSTAINABILITY

The term Sustainable Development, is defined by the Department for the Environment, Food and Rural Affairs as:

'… making sure people throughout the world can satisfy their basic needs now, while making sure that future generations can also look forward to the same quality of life. It recognises that the "three pillars" – economy, society and environment – are interconnected.'

United Nations Framework Convention on Climate Change

To achieve this objective of sustainable development in any industry, sector strict regulations have been put in place that have filtered down through EU Directives from the European Climate Change Programme, to National UK Acts such as the Climate Change Act 2008, to Local Policy in the form of Core Strategies. However, there are larger drivers behind the concept of sustainable development.

Kyoto Protocol

In 1997, the Kyoto Protocol was adopted as part of the United Nations Framework Convention on Climate Change, to which the UK is a signatory. The key feature of the protocol was the binding targets that were set for industrialised countries to reduce their Green House Gas emissions by 12.5% below 1990 levels by 2008-2012.

Cancun Agreements

Since the initial adoption of the Kyoto Protocol, extensive research has been put forward as to the causes and markers of climate change from the Intergovernmental Panel on Climate Change, which has led to new targets and objectives being made. In 2012, the international community met to discuss new directions for responding to climate change by adopting new agreements. The key objectives of the Cancun Agreements are:

- *Establish clear objectives for reducing human-generated greenhouse gas emissions over time to keep the global average temperature rise below two degrees;*
- *Mobilise the development and transfer of clean technology to boost efforts to address climate change, getting it to the right place at the right time and for the best effect;*
- *Assist the particularly vulnerable people in the world to adapt to the inevitable impacts of climate change;*
- *Protect the world's forests, which are a major repository of carbon;*
- *Establish effective institutions and systems which will ensure these objectives are implemented successfully.*

COP21: Paris Global Climate Agreement

In December 2015, a global climate deal was reached in a summit involving all of the world's nations. The targets of this aimed principally to curb the dangerous levels of climate change and drive an increase low-carbon infrastructure investment. Numerous organisations and corporations also committed to helping create a greener future by making their own pledges through the course of the summit. The key elements of the agreement are:

- *To keep global temperatures "well below" 2.0°C above pre-industrial times and "endeavour to limit" them even more, to 1.5C*
- *To limit the amount of greenhouse gases emitted by human activity to the same levels that trees, soil and oceans can absorb naturally, beginning at some point between 2050 and 2100*
- *To review each country's contribution to cutting emissions every five years so they scale up to the challenge*
- *For rich countries to help poorer nations by providing "climate finance" to adapt to climate change and switch to renewable energy.*

BRE's COP21 Climate Pledge (December 2015)

"We commit to continue to drive best practice and carbon reduction, as we have through the use of BREEAM for the past 25 years. By reaching over 9,000 BREEAM rated buildings we predict emissions savings will be in excess of 900,000 tonnes of CO_2, compared to regulatory minimum performance requirements, by 2020. Saving not only carbon, but bringing wider benefits to both the owner and occupiers."

4 NATIONAL POLICY

National Planning Policy

An effective planning system is required to contribute to achieving sustainable development. The ***National Planning Policy Framework*** (NPPF), 2023, outlines what the government deems as sustainable development in England.

Sustainable development is defined as having the following three overarching objectives which are interdependent and need to be pursued in mutually supportive ways: an economic objective, a social objective, and an environmental objective.

1. Economic objective – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;

2. Social objective – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed and safe built environment, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and

3. Environmental objective – to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.

The above objectives can be described as an energy trilemma, this is demonstrated in Figure 4.1 below. Each dimension is dependent on each other and sustainable development proposals should adhere to each role. This energy statement shall ensure the proposed Development is one that contributes economically, socially and environmentally in accordance with the NPPF, 2023.

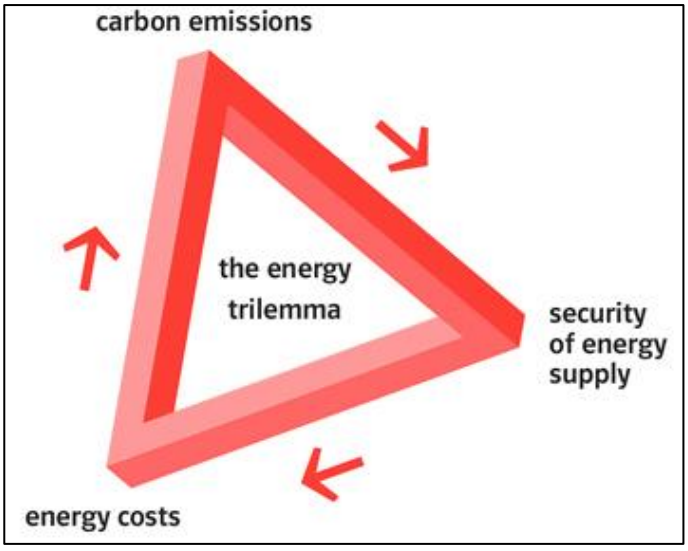


Figure 4.1 The Energy Trilemma

Guidance has been followed from the (NPPF), 2023, to provide an energy strategy which reduces energy use and carbon emissions, in line with best practice. This will provide a balanced scheme which focuses on optimal use of non-renewable resources (energy efficiency measures) whilst providing a renewable energy strategy best suited to the sites and their building uses. Below are some key extracts relevant to the development from Chapter fourteen 'Meeting the Challenge of Climate Change, Flooding & Coastal Change':

Paragraph 158

Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures. Policies should support appropriate measures to ensure the future resilience of communities and infrastructure to climate change impacts, such as providing space for physical protection measures, or making provision for the possible future relocation of vulnerable development and infrastructure.

Paragraph 159

New development should be planned for in ways that:

a. avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure; and

b. can help to reduce greenhouse gas emissions, such as through its location, orientation and design. Any local requirements for the sustainability of buildings should reflect the Government's policy for national technical standards.

Paragraph 160

To help increase the use and supply of renewable and low carbon energy and heat, plans should:

a. provide a positive strategy for energy from these sources, that maximises the potential for suitable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts);

b. consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and

c. identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for locating potential heat customers and suppliers.

Paragraph 161

Local planning authorities should support community-led initiatives for renewable and low carbon energy, including developments outside areas identified in local plans or other strategic policies that are being taken forward through neighbourhood planning.

Paragraph 162

In determining planning applications, local planning authorities should expect new development to:

a. comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and

b. take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.

Paragraph 163

When determining planning applications for renewable and low carbon development, local planning authorities should:

a. not require applicants to demonstrate the overall need for renewable or low carbon energy, and recognise that even small-scale projects provide a valuable contribution to cutting greenhouse gas emissions;

b. approve the application if its impacts are (or can be made) acceptable. Once suitable areas for renewable and low carbon energy have been identified in plans, local planning authorities should expect subsequent applications for commercial scale projects outside these areas to demonstrate that the proposed location meets the criteria used in identifying suitable areas; and

c. in the case of applications for the repowering and life-extension of existing renewable sites, give significant weight to the benefits of utilising an established site, and approve the proposal if its impacts are or can be made acceptable.

5 LOCAL POLICY

This section aims to highlight guidance available and the minimum requirements at local level from The Manchester Core Strategy Development Plan Document 2012-2027 which states the Council's vision, spatial strategy and policies for the future development of the area.

Core Strategy Development Plan Document:

Policy EN 4: Reducing CO2 Emissions by Enabling Low and Zero Carbon Development

The Council will seek to reduce fuel poverty and decouple growth in the economy, growth in CO2 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 CO2 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 or 12.2, 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 CO2emissions 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.

Domestic CO2 emissions reduction targets:

Target	% Minimum requirement
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

Non-domestic CO2 emissions reduction targets:

Target	% Minimum requirement
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 (Applies to commercial uses with a high proportion of emissions from electricity use (>45 kg CO2/m2)).	+10% increase on Part L 2010
Target 3: Micro generation area	+15%increase on Part L 2010

Where the CO2 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 CO2 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.

Policy EN 8: Adaptation to Climate Change

All new development will be expected to be adaptable to climate change in terms of the design, layout, siting and function of both buildings and associated external spaces. In achieving developments which are adaptable to climate change developers should have regard to the following, although this is not an exhaustive list:

- Minimisation of flood risk by appropriate siting, drainage, and treatment of surface areas to ensure rain water permeability
- Reduction in urban heat island effect through the use of Green Infrastructure such as green roofs, green walls, increased tree cover and waterways

- The need to control overheating of buildings through passive design.
- The opportunity to provide linked and diverse green space to enhance natural habitats which will assist species adaptation. Developers will be permitted to use green infrastructure elements such as green roofs, green walls, street trees and waterways to contribute to compliance with CO2 mitigation under Policy EN6, subject to sufficient evidence to quantify their contribution to compliance.

Policy EN 14: Flood Risk

- In line with the risk-based sequential approach contained within PPS25, development should be directed away from sites at the greatest risk of flooding, and towards sites with little or no risk of flooding; this should take account of all sources of flooding identified in the Manchester-Salford Trafford Strategic Flood Risk Assessment (SFRA).
- In addition to the requirements for site-specific Flood Risk Assessments (FRAs) set out in PPS25, an appropriate FRA will also be required for all development proposals, including changes of use, on sites greater than 0.5ha within Critical Drainage Areas (CDAs) and Canal Hazard Zones identified in the SFRA.
- All new development should minimise surface water run-off, including through Sustainable Drainage Systems (SUDS) and the appropriate use of Green Infrastructure. Developers should have regard to the surface water run-off rates in the SFRA User Guide. In CDAs, evidence to justify the surface water run off approach / rates will be required.
- The City of Manchester contains many sections of rivers which are culverted or 'hidden'; where these are indicated in the SFRA beneath the proposed development site, further investigation will be required and the development proposal should take this into account; where feasible and appropriate development should seek to open up culverted/hidden rivers to reduce the associated flood risk and danger of collapse, taking advantage of opportunities to enhance biodiversity and Green Infrastructure.

Policy EN 15: Biodiversity and Geological Conservation

The Council will seek to maintain or enhance sites of biodiversity and geological value throughout the City. Particular consideration will be given to:

- sites with international or national designations for their biodiversity value. Manchester contains one Site of Special Scientific Interest (SSSI) (Cotteril Clough); there is a Special Area of Conservation (SAC) and an SSSI just over the border in Oldham (both on the Rochdale Canal within Oldham);
- other sites of biodiversity value, including Sites of Biological Importance (SBIs) and Local Nature Reserves (LNRs); Manchester currently has 35 SBIs (including the Rochdale and Ashton Canals) and 7 LNRs; priority habitats found within Manchester, as listed in the Manchester Biodiversity Strategy and included in the Greater Manchester Biodiversity Action Plan (GM BAP);
- protected and priority species, as listed in the Manchester Biodiversity Strategy and included in the Greater Manchester Biodiversity Action Plan (GM BAP);
- sites that are recognised for their geological importance;
- the Council's objective to protect and conserve the City's existing trees and woodlands and the aim for a net increase in trees across the City.

Policy EN 16: Air Quality

The Council will seek to improve the air quality within Manchester, and particularly within Air Quality Management Areas, located along Manchester's principal traffic routes and at Manchester Airport. Developers will be expected to take measures to minimise and mitigate the local impact of emissions from traffic generated by the development, as well as emissions created by the use of the development itself, including from Combined Heat and Power and biomass plant.

When assessing the appropriateness of locations for new development the Council will consider the impacts on air quality, alongside other plan objectives. This includes cumulative impacts, particularly in Air Quality Management Areas.

Policy EN 17: Water Quality

With reference to the Manchester-Salford-Trafford SFRA and other relevant documents:

- Development should avoid any adverse impact on water quality, including during the construction phase, and wherever possible should seek to enhance water quality, both chemical and ecological;
- Development should minimise surface water run-off from development and associated roads, and maximise the use of appropriate sustainable drainage systems, to minimise groundwater contamination, and to avoid pollutants reaching watercourses;
- Development close to a watercourse should also ensure that waste or litter cannot enter the watercourse from the site;
- Development should, where feasible and appropriate, seek to open up any culverted or hidden watercourse beneath the site to improve the ecological status of that watercourse.

Policy EN 19: Waste

The Council will

- Work with other Districts through the Greater Manchester Joint Waste Development Plan Document (GMJWDPD) to safeguard existing sites for waste management and identify and safeguard new sites in existing areas of employment where appropriate.
- Require all developers, including those of new waste management facilities within the District, to demonstrate the proposal's consistency with the principles of the waste hierarchy (prevention, reduction, re-use, recycling/composting, energy recovery, final disposal)
- Require all developers of new waste management facilities within the District to plan for and, where appropriate, use sustainable modes for waste transport, including use of modes such as rail and the Manchester Ship Canal.
- Require all developers to submit a waste management plan to demonstrate how both construction and demolition waste will be minimised and recycled on site wherever possible and how the sustainable waste management needs of the end user will be met.
- Have full regard to the economic and environmental benefits that well designed and run, waste management facilities can bring to the District, subject to any conditions required to protect the amenity of existing adjacent users. Promote the development of innovation and technological advancement within the sustainable waste management industry, aiming to achieve a closed-loop waste management system.
- Require waste management practices to have full regard to the environmental, social and economic impacts of such development and encourage long-term benefits in improving the environment, the regeneration of areas in need of investment and co-location with other employment uses where appropriate.
- Encourage communities to take responsibility for the waste they create through the provision of accessible facilities.

Policy T 1: Sustainable Transport

To deliver a sustainable, high quality, integrated transport system to encourage modal shift away from car travel to public transport, cycling and walking, to support the needs of residents and businesses and to prepare for carbon free modes of transport, the Council will support proposals that: -

- Improve choice by developing alternatives to the car.
- Promote regeneration and economic vitality by relieving traffic congestion and improving access to jobs and services, particularly for those most in need and for those without a car.

- Improve access to transport services and facilities in order to enable disabled people and people with mobility impairments to participate fully in public life.
- Improve pedestrian routes and the pedestrian environment.
- Improve and develop further Manchester's cycle network (for example the Manchester Cycleway and the Trans Pennine Trail).
- Contribute to improvements to the extent and reliability of the public transport network through safe and attractive waiting and interchange facilities, better priority, improved services and information provision.
- Improve and develop appropriate road, rail and water freight transport routes and associated intermodal freight transport facilities in order to assist in the sustainable and efficient movement of goods.
- Facilitate modes of transport that reduce carbon emissions e.g by incorporating charging points for electric vehicles, subject to their appropriate design and location. Would reduce the negative impacts of road traffic, for example, congestion, air pollution and road accident casualties.
- Take account of the needs of road users according to a broad hierarchy consisting of, in order of priority:
    1. pedestrians and disabled people
    2. cyclists, public transport,
    3. commercial access,
    4. general off peak traffic,
    5. general peak time traffic

6 ENERGY USAGE AND CARBON EMISSIONS

Government policies require significant energy reductions from buildings. Building a Greener Future sets a planned trajectory (delivered via Part L of the building regulations 2021) with an aspiration for all non-domestic new buildings to be zero carbon by 2020. The Climate Change Act (Nov 2008) sets the UK targets of; CO_2 reduction of 26% by 2020 and CO_2 reduction of 100% by 2050.

6.1 POLICY REVIEW

National Planning Policy Framework (2023)

Section 14 – Meeting the Challenge of Climate Change, Flooding and Coastal Change

Paragraph 160: To help increase the use and supply of renewable and low carbon energy and heat, plans should;

a. provide a positive strategy for energy from these sources, that maximises the potential for suitable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts);

b. consider identifying suitable areas for renewable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and

c. identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for collocating potential heat customers and suppliers.

Core Strategy Development Plan Document (2012-2027)

Policy EN 6: Target Framework for CO2 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 or 12.2, 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 CO2emissions for all phases of the development.

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- 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.

Domestic CO2 emissions reduction targets:

Target	% Minimum requirement
Target 1: Network development area	CHP/district heating anchor or connection or where not feasible a 15% increase on Part L 2010
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Target 3: Micro generation area	+15%increase on Part L 2010

Non-domestic CO2 emissions reduction targets:

Target	% Minimum requirement
Target 1: Network development area	CHP/district heating anchor or connection or where not feasible a 15% increase on Part L 2010
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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 CO2 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.

6.2 DEVELOPEMENT SUSTAINABILITY FEATURES

Energy modelling has been undertaken which adopts the following hierarchy for reducing carbon emissions for the development; Be Lean, Be Clean, Be Green.

The total baseline energy and carbon emissions for the development (built to Part L 2021), taking into account regulated energy demands are:

- ***102,364.76 kWh/annum***
- ***16.26 Tonnes CO2/annum***

The primary energy demands of the development will be:

- *Lighting;*
- *General power;*
- *Heating and ventilation;*
- *Cooling*
- *Hot water supply.*

Unregulated energy use is not covered by existing regulations and includes energy consumed by the occupants through activities and appliances; in this case it would typically be small power usage (appliances, computers etc.). The following unregulated energy use for the development was calculated:

- ***30,709.43 kWh/annum***
- ***4.88 Tonnes CO_2/annum***

Be Lean

To provide energy and carbon saving further to a base Part L (2021) build; targeting compliance with local and national policies, the following passive design and energy efficiency measures are recommended.

The following 'U' values shall be incorporated within the development, in accordance with Part L (2021):

- *External Walls - U = 0.22 W/m².K;*
- *Exposed Floors - U = 0.18 W/m².K;*
- *Exposed Roofs - U = 0.15 W/m².K;*
- *Glazing - U = 1.2 W/m².K;*
- *Vehicle Doors - U = 1.3 W/m².K;*
- *Air Permeability - 5 m^3/hr/m^2@ 50 Pa.*

Together with the above passive design measures, the proposed energy strategy includes the following energy efficiency measures throughout the development:

- *The provision of energy efficient lighting (PIR controls and occupancy sensing in relevant areas);*
- *The provision of zonal thermal and lighting controls;*
- *The provision of variable speed pumps and fans;*
- *The enhancement of pipework and ductwork, thermal insulation;*
- *Specific Fan Powers improved beyond Part L requirements.*

Be Clean

It was investigated to establish if there were any existing decentralised energy networks near the proposed site using the Department of Energy and Climate Change CHP database. It has been concluded that there are no suitable existing nearby CHP systems to which a connection may be possible.

In order to economically justify installing a CHP unit on any site, a minimum requirement of 4,000 hours running time per year is necessary. Based on the building types being Industrial, there is a low heating and hot water demand for a continuous period over the year, typically a maximum of circa 2,117 hours is anticipated.

Months	Load per Day (hrs)	Load per week (hrs)	Load per month (hrs)	Load for 6 months (hrs)	
April to Sept	2	14	58.8	352.8	
October to March	10	70	294	1,764.0	
		Total approximate Load for a year		2,116.8	hours
		Minimum required hours		4,000.0	hours

Table 6.1 CHP Analysis

Be Green

Further means of reducing energy and carbon emissions for the development have been explored, through the use of renewable technologies. The following, Table 6.2, reviews the primary options for generation of on-site renewable/ Low or Zero Carbon (LZC) energy and considers their suitability for use on the development.

Renewable Technology Feasibility Assessment		Viable?
Bio Fuel Boilers 	Bio-fuel boilers are specifically designed to burn solid biomass or liquid bio-fuel in order to heat water, or raise steam. This can then be used for space heating or Domestic Hot Water (DHW) supply. Bio-fuel boilers could potentially provide the annual space heating and DHW demand for the Unit, however they are not recommended for this development for the following reasons:- 1. Biomass boilers generate increased Oxides of Nitrogen (NOx) and particulates (PM10) which would affect air quality. 2. The storage requirements for the biofuel would require a large plant space, with an auxiliary storage facility to allow for a two week period where delivery of fuel might not be available.	No
Land Use Large volumes of storage is required for fuel at ground level or basement level with sufficient vehicular access for fuel delivered. Noise Noise levels are generated by the operation of the bio-fuel boiler and associated deliveries of the bio-fuel. The plant room enclosure will have to be attenuated to acceptable levels imposed by planning and Acoustician recommendations.		

Renewable Technology Feasibility Assessment		Viable?
Wind Turbines 	Wind turbines convert the kinetic energy in the wind into mechanical energy which is then converted into electricity. Wind turbines can provide electrical power either directly to a load or via a battery system. The use of wind turbines is not recommended for this development for the following reasons:- 1. Wind turbines, of a size necessary to make a contribution to the Unit renewable energy requirements are considered inappropriate on spatial, planning, aesthetic and noise grounds. Noise pollution from commercial wind turbines can be quiet significant within a few hundred metres. 2. The site is not ideal; an ideal site is a hill with a flat, clear exposure. It should be free from strong turbulence and obstructions like large trees, houses or other buildings. As the development is surrounded by industrial buildings, turbulent wind flow will be experienced across the site which is not ideal for wind turbine installations. 3. The financial viability of a small scale installation on the site would be compromised by the operational efficiency of the unit (circa 30%). 4. Wind turbines, can cause electrical interference within a 2km radius. 5. Finally, the main disadvantage is down to the winds unreliability factor. The wind strength is often too low in many areas, where this site is located the wind speed is 4.4 m/s at 10m, as can be seen in the wind map presented in Appendix C, in order for the wind turbines to be feasible, wind speeds of greater than 5.5m/s are required.	No
<u>Land Use</u> There would be an adverse visual impact on the site which will be dependent on the height at which the wind turbines are located. <u>Noise</u> Noise levels are generated by the rotating blades; these noise levels will vary dependent on wind velocity and will need to be in acceptable levels imposed by planning and Acoustician recommendations.		
Ground Source Heat Pumps 	Space cooling and heating can be provided by circulating water cooled or heated directly by the ground or via subterranean water. Ground water cooling and heating through the use of aquifers makes use of the relatively stable ground/ water temperature which is available at a temperature range of 10 – 14°C. The use of Ground Source Heat Pumps is not recommended for this development for the following reasons:- 1. Cost of boreholes may be prohibitive (subject to site geological conditions). 2. Favourable ground conditions may not exist. 3. Problems can arise with boreholes silting up (open-loop). 4. Changes in local ground conditions could affect water quality and the amount that can be extracted (open-loop).	No

Renewable Technology Feasibility Assessment		Viable?
Land Use This installation would require Environmental Agency approval. Ground and Hydrology analysis would be required to investigate if favourable conditions exist. Noise There are no noise issues generated by this technology.		
Solar Water Heating 	Solar Water Heating systems use radiant energy from the sun to heat water. Systems comprise of a roof mounted heat collector piped to a coil located within a hot water storage cylinder.	No
Land Use Roof space is better served for the installation of Photovoltaic panels. Noise Noise levels are generated by pumps at roof level, these are insignificant so should pose no issues.		
Air Source Heat Pumps 	An Air Source Heat Pump extracts heat from the outside air in the same way that a fridge extracts heat from its inside. It can extract heat from the air even when the outside temperature is as low as minus 15°C and typically draws approximately a quarter to a third of the electricity of a standard resistance heater for the same amount of heating, reducing utility bills. This typical efficiency compares to 70-95% for a fossil-fuel powered boiler. Air Source Heat Pumps (ASHP) are proposed for use within the office areas to provide the heating and cooling requirements. The benefits of ASHP are as follows: 1. They are ideally suited to serve the office areas within the development during periods when they may require heating or cooling. The times when cooling is required may differ for different space depending on their use, occupancy period and levels, the operation of individual air source heat pumps would allow individual control and can be efficiently accommodated within the building design; 2. The heat pump unit can be configured to provide internal heat reclaim from dissimilar environmental zones, reducing energy consumption and carbon emissions.	**Yes**
Land Use Air Source Heat Pumps can be installed on ground mounted, roof mounted or wall mounted frames. When installing Air Source Heat Pumps there are various factors to consider; Heat Pumps should be positioned to provide shelter from high winds which can reduce efficiency by causing defrost problems. Noise Noise levels are generated by fans, and compressors causing vibrations. The noise levels are dependent on manufacturer and vary accordingly, these will need to be in acceptable levels imposed by planning and Acousticians recommendations.		

<table>
<tr><th>Renewable Technology Feasibility Assessment</th><th>Viable?</th></tr>
<tr><td>Photovoltaics

Photovoltaic (PV) modules convert sunlight directly to DC electricity. The solar cells consist of a thin piece of semiconductor material, in most cases silicon.

The 6 industrial units will be provided with 178 kWp of PV panels.

<table><tr><th></th><th>kWp</th></tr><tr><td>Unit 1</td><td>70</td></tr><tr><td>Unit 5</td><td>45</td></tr><tr><td>Unit 6</td><td>16</td></tr><tr><td>Unit 7</td><td>15</td></tr><tr><td>Unit 8</td><td>15</td></tr><tr><td>Unit 9</td><td>17</td></tr><tr><td>Total</td><td>178</td></tr></table></td><td rowspan="2">Yes</td></tr>
<tr><td colspan="2">Land Use
There are no land issues or adverse visual impacts as the photovoltaic panels are roof mounted.
Noise
There are no noise issues generated by this technology.</td></tr>
</table>

Table 6.2 Renewable Energy Options

6.3 SUMMARY

By applying the above passive design and PV measures the savings generated are displayed in Table 6.3, and Figures 6.1 – 6.2. The full calculations can be seen in Appendix D.

	Carbon Dioxide Emissions (Tonnes CO_2 per annum)	
	Regulated	Unregulated
Baseline: Part L 2021 of the Building Regulations Compliant Development	16.26	4.88
After Energy Efficient, Passive, ASHP and PV Measures	11.35	It is anticipated that a circa 3% saving can be achieved through the use of energy efficient fittings, for example A or A+ appliances. This would reduce the unregulated carbon emissions to: 4.73
Total Cumulative Saving	**4.92 (30.24%)**	**0.15**

Table 6.3 Carbon Dioxide Emissions

The energy strategy for the development is shown in table 6.4 below

Development Energy Strategy	
Heating	ASHP has been used within the Office spaces and panel heaters for the WC and Circulation spaces.
Cooling	Cooling within office spaces has been provided by the ASHP.
Ventilation	MVHR within office and extract fans for the WC.
Hot Water (DHW)	Instantaneous Hot Water only.
Lighting	Energy efficient LED lighting where applicable. The following figures have been utilised for each space: • *Warehouse: 160 lm/w, 300 lux* • *Office: 140 lm/w, 500 lux* • *WC and core areas: 110 lm/w, 150 lux*

Table 6.4 Development Energy Strategy

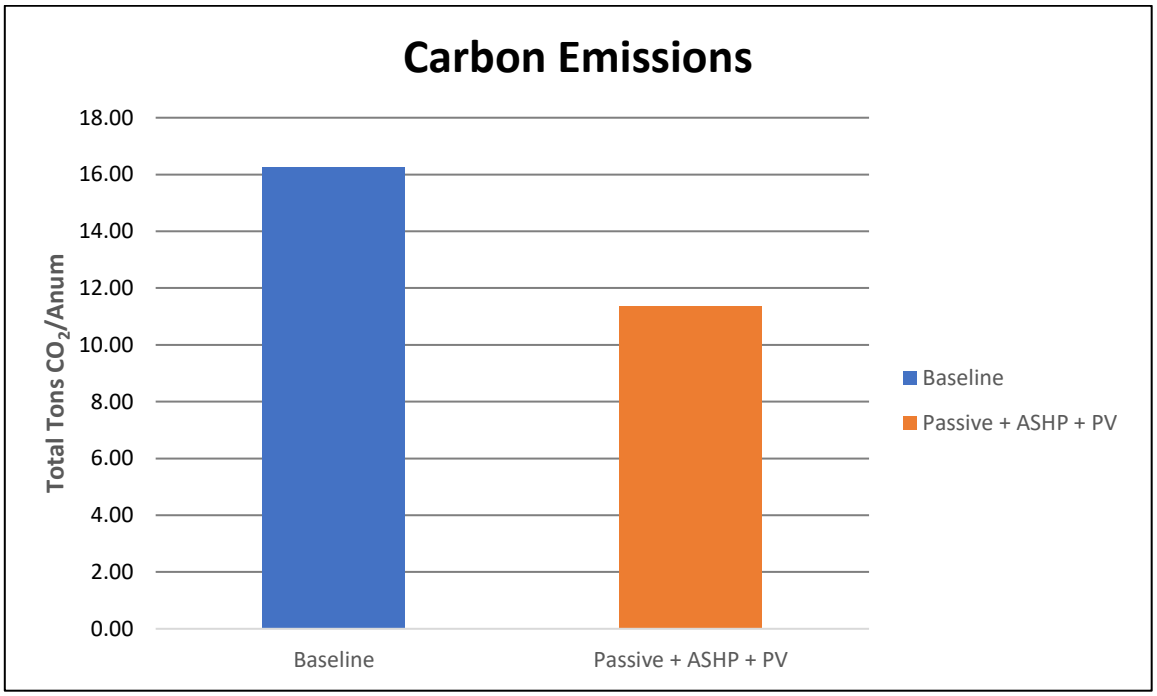


Figure 6.1 Site Carbon Emissions

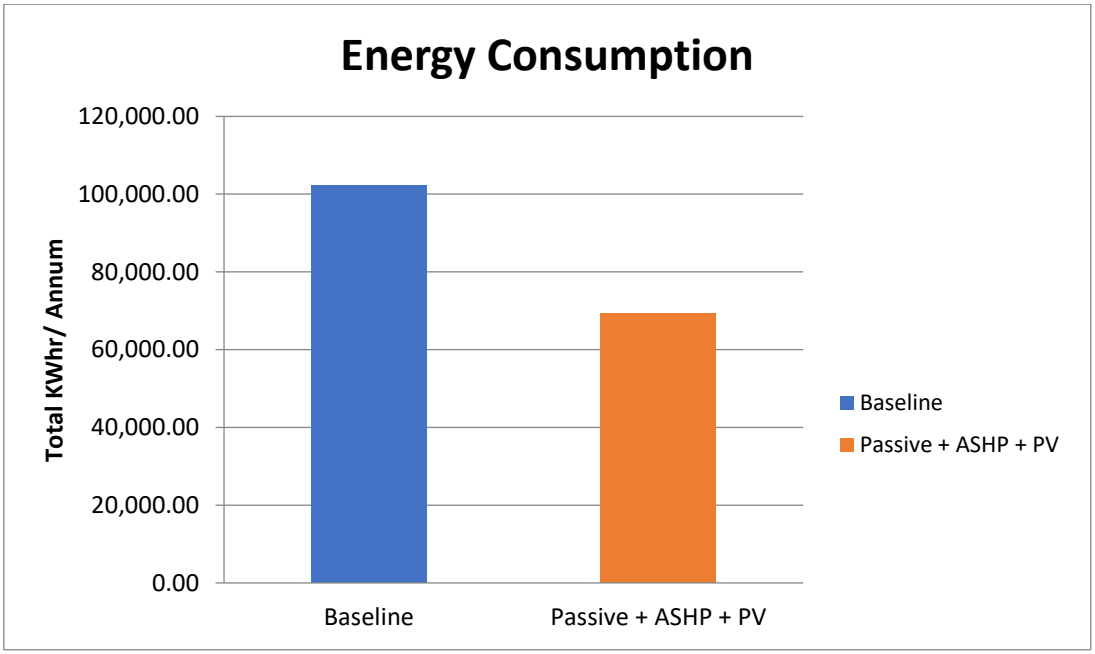


Figure 6.2 Site Energy Consumption

The above review has resulted in the formulation of an Energy Strategy that may be adopted for the development involving the use of passive design and energy efficiency measures aimed at achieving the targets and recommendations set out by Manchester City Council. The current energy strategy for the development includes the use of Air Source Heat Pump and Photovoltaic Array.

The recommended schemes take into consideration the most appropriate technologies available to the site, which provides a scheme that is commercially viable whilst keeping in compliance with National and Local Policies. The use of further/emerging technologies may be included for use within this development if their feasibility increases in the future, in accordance with best practice

7 WATER CONSUMPTION

The ever-increasing impacts of climate change are continuously inflating demand for water, as well as increasing a need for awareness towards water usage. The UK is already under a large amount of pressure regarding water resources. To contribute towards mitigating this issue, the proposed development will consider various means of being economical with water consumption.

7.1 POLICY REVIEW

Core Strategy Development Plan Document (2012-2027)

Policy EN 17: Water Quality

With reference to the Manchester-Salford-Trafford SFRA and other relevant documents:

- Development should avoid any adverse impact on water quality, including during the construction phase, and wherever possible should seek to enhance water quality, both chemical and ecological;
- Development should minimise surface water run-off from development and associated roads, and maximise the use of appropriate sustainable drainage systems, to minimise groundwater contamination, and to avoid pollutants reaching watercourses;
- Development close to a watercourse should also ensure that waste or litter cannot enter the watercourse from the site;
- Development should, where feasible and appropriate, seek to open up any culverted or hidden watercourse beneath the site to improve the ecological status of that watercourse.

7.2 DEVELOPMENT SUSTAINABILITY FEATURES

In order to ensure the reduction and management of water consumption within the proposed industrial units, it is anticipated that various measures shall be undertaken, and specific features installed during the fit out works to minimise the building's potable water consumption.

It is anticipated that improvements in the consumption of potable water will be achieved through the specification of water efficient components within sanitary areas during the fit out works. Such features include the specification of low flow taps as well as dual flush toilets with reduced flush volumes.

7.3 SUMMARY

To ensure the sustainability of the development it is anticipated that water efficient fixtures will be incorporated into the design, such as low flow taps and dual flush toilets with reduced effective flush volumes.

To be further sustainable, it is anticipated that pulsed water meters will be installed on the mains water supply, to effectively monitor water consumption. The inclusion of the above sustainability features allows for the development to be deemed sustainable with regard to water consumption.

8 TRANSPORT

Transport produces a large proportion of the country's greenhouse gas emissions, something which government at both national and local level are striving to combat, especially through planning frameworks for new developments. Solutions to transport issues are to be incorporated into the design of the development.

8.1 POLICY REVIEW

National Planning Policy Framework (2023)

Section 9 – Promoting Sustainable Transport

108: Transport issues should be considered from the earliest stages of plan-making and development proposals, so that:

a) the potential impacts of development on transport networks can be addressed;
b) opportunities from existing or proposed transport infrastructure, and changing transport technology and usage, are realised – for example in relation to the scale, location or density of development that can be accommodated;
c) opportunities to promote walking, cycling and public transport use are identified and pursued;

Core Strategy Development Plan Document (2012-2027)

Policy T 1: Sustainable Transport

To deliver a sustainable, high quality, integrated transport system to encourage modal shift away from car travel to public transport, cycling and walking, to support the needs of residents and businesses and to prepare for carbon free modes of transport, the Council will support proposals that: -

- Improve choice by developing alternatives to the car.
- Promote regeneration and economic vitality by relieving traffic congestion and improving access to jobs and services, particularly for those most in need and for those without a car.
- Improve access to transport services and facilities in order to enable disabled people and people with mobility impairments to participate fully in public life.
- Improve pedestrian routes and the pedestrian environment.
- Improve and develop further Manchester's cycle network (for example the Manchester Cycleway and the Trans Pennine Trail).
- Contribute to improvements to the extent and reliability of the public transport network through safe and attractive waiting and interchange facilities, better priority, improved services and information provision.
- Improve and develop appropriate road, rail and water freight transport routes and associated intermodal freight transport facilities in order to assist in the sustainable and efficient movement of goods.
- Facilitate modes of transport that reduce carbon emissions e.g by incorporating charging points for electric vehicles, subject to their appropriate design and location. Would reduce the negative impacts of road traffic, for example, congestion, air pollution and road accident casualties.
- Take account of the needs of road users according to a broad hierarchy consisting of, in order of priority:
    1. pedestrians and disabled people
    2. cyclists, public transport,
    3. commercial access,
    4. general peak time traffic

8.2 DEVELOPMENT SUSTAINABILITY FEATURES

The proposed development is located on Crabtree Lane, next to the A662 Road. The development is at a walking distance from nearest bus stop and Tram Edge Lane stop enabling transportation access easy in the town as shown in Figure 8.1 below. Primary amenities like food outlets and Post office are available within walking distance.

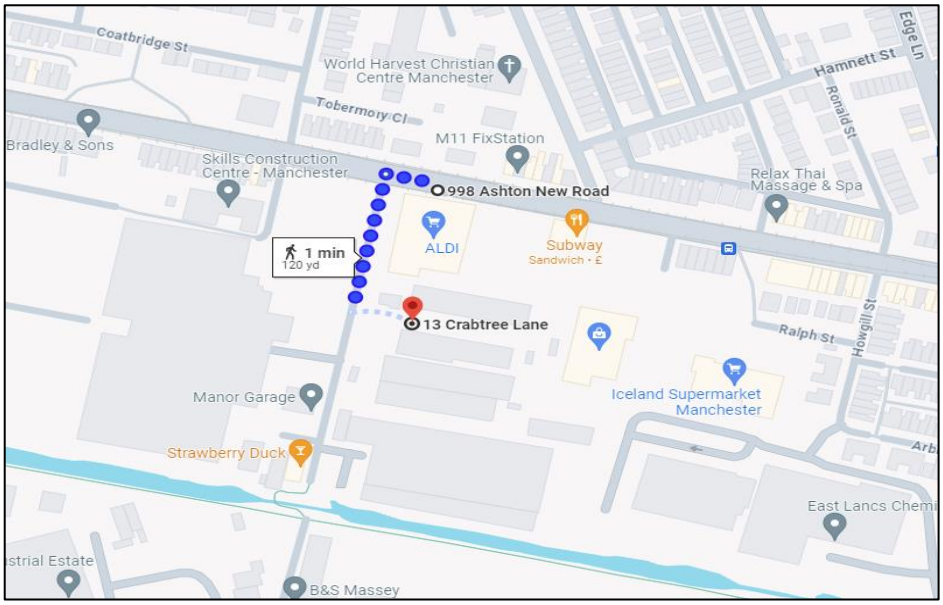


Figure 8.1 Nearest Bus stop

8.3 SUMMARY

The above provisions aim to make the proposed development easier to access for all building users, as well as offering a sustainable means of commuting rather than using a private vehicle. The site is situated a 1-minute walk from the nearest bus stop and Edge Lane tram station is 7-minutes away, this allows for a fair provision of public transport

9 CONSTRUCTION SITE MANAGEMENT

The requirement for new materials needs to be minimised, by re-using existing buildings and materials where possible and providing a Site Waste Management Plan for all construction sites. This responsibility lies with the contractor and needs to be clarified at an early design stage. It is becoming a greater requirement now to construct buildings that are flexible and can be re-used.

9.1 POLICY REVIEW

National Planning Policy Framework (2023)

Local plans should set out strategic priorities for the area; this should include strategic policies to deliver the provision of infrastructure for waste management, water supply and wastewater.

Core Strategy Development Plan Document (2012-2027)

Policy EN 19: Waste

The Council will

- Work with other Districts through the Greater Manchester Joint Waste Development Plan Document (GMJWDPD) to safeguard existing sites for waste management and identify and safeguard new sites in existing areas of employment where appropriate.
- Require all developers, including those of new waste management facilities within the District, to demonstrate the proposal's consistency with the principles of the waste hierarchy (prevention, reduction, re-use, recycling/composting, energy recovery, final disposal)
- Require all developers of new waste management facilities within the District to plan for and, where appropriate, use sustainable modes for waste transport, including use of modes such as rail and the Manchester Ship Canal.
- Require all developers to submit a waste management plan to demonstrate how both construction and demolition waste will be minimised and recycled on site wherever possible and how the sustainable waste management needs of the end user will be met.
- Have full regard to the economic and environmental benefits that well designed and run, waste management facilities can bring to the District, subject to any conditions required to protect the amenity of existing adjacent users. Promote the development of innovation and technological advancement within the sustainable waste management industry, aiming to achieve a closed-loop waste management system.
- Require waste management practices to have full regard to the environmental, social and economic impacts of such development and encourage long-term benefits in improving the environment, the regeneration of areas in need of investment and co-location with other employment uses where appropriate.
- Encourage communities to take responsibility for the waste they create through the provision of accessible facilities

9.2 DEVELOPMENT SUSTAINABILITY FEATURES

In order to comply with national and local policy, it is anticipated that certain measures will be put into place for this development, such as a Site Waste Management Plan which monitors the site energy and water consumption. Further to this the Site Waste Management Plan should also monitor the resource efficiency of the development construction works as well as the percentage of non-hazardous materials, excavation and construction, which have been diverted from landfill.

It is expected that the main contractor will also set targets and monitor site consumption data for water consumption, energy consumption as well as fuel from deliveries and collection of waste and materials to and from site. Monitoring of such actions can encourage contractors to become more resource efficient to meet given targets.

Additionally, it is expected the main contractor will comply with best standards as set out in the Considerate Constructors Scheme, achieving a score which is considered as exceeding compliance with the criteria of the scheme.

To ensure the sustainable construction of the development, the project will consider the concept of the waste hierarchy as seen in Figure 9.1 below. The waste hierarchy recognises the need for waste to be considered for a variety of waste streams before being sent to land fill as a last resort. The hierarchy is as follows:

- *Waste minimisation;*
- *Reusing or waste or up cycling;*
- *Recycling of all applicable materials;*
- *Recovery of energy from waste (anaerobic digestion plants);*
- *Waste is sent to landfill.*

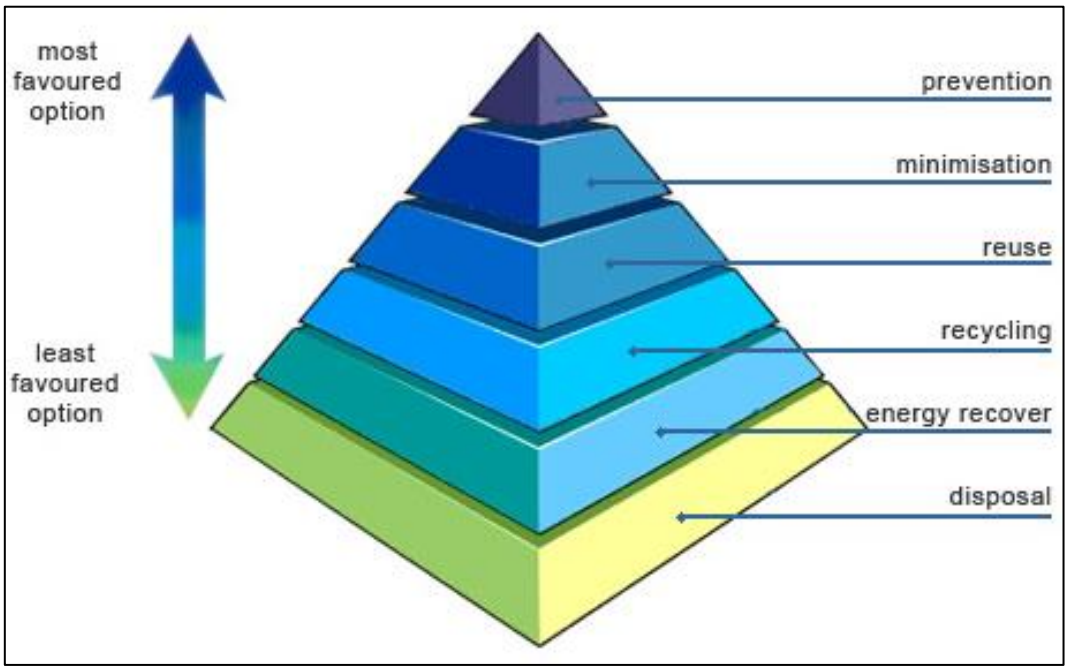


Figure 9.1 Waste Hierarchy Diagram

9.3 SUMMARY

It is anticipated that this development will produce a Site Waste Management Plan, highlighting key refurbishment materials and the correct waste streams for recycling these materials. For more details on Waste management, please refer to the Chancerygate Waste proforma completed as part of planning submission.

The development should adhere to a Considerate Constructors Scheme, achieving a targeted score which exceeds 'compliance' with the criteria of the scheme. As a result of these measures, the development may be deemed sustainable as regards to construction site management.

10 SUSTAINABLE DESIGN

Good urban design is essential in providing a varied and sustainable environment, which can facilitate opportunities for positive contributions within communities. As part of sustainable design for developments, it is essential that suitable design principles are followed to maximise opportunities for energy reduction through design as well as ensuring buildings follow or enhance the character of an area. Developments should also give further consideration to the level of security and comfort that is provided for future building users, including thermal and visual comfort, inclusivity and safe access.

10.1 POLICY REVIEW

National Planning Policy Framework (2023)

Section 12- Achieving Well-Designed Places

131: The creation of high quality, beautiful and sustainable buildings and places is fundamental to what the planning and development process should achieve. Good design is a key aspect of sustainable development, creates better places in which to live and work and helps make development acceptable to communities. Being clear about design expectations, and how these will be tested, is essential for achieving this. So too is effective engagement between applicants, communities, local planning authorities and other interests throughout the process.

Core Strategy Development Plan Document (2012-2027)

Policy EN 8: Adaptation to Climate Change

All new development will be expected to be adaptable to climate change in terms of the design, layout, siting and function of both buildings and associated external spaces. In achieving developments which are adaptable to climate change developers should have regard to the following, although this is not an exhaustive list:

- Minimisation of flood risk by appropriate siting, drainage, and treatment of surface areas to ensure rain water permeability
- Reduction in urban heat island effect through the use of Green Infrastructure such as green roofs, green walls, increased tree cover and waterways
- The need to control overheating of buildings through passive design.
- The opportunity to provide linked and diverse green space to enhance natural habitats which will assist species adaptation. Developers will be permitted to use green infrastructure elements such as green roofs, green walls, street trees and waterways to contribute to compliance with CO2 mitigation under Policy EN6, subject to sufficient evidence to quantify their contribution to compliance.

d) Making sure the design of new development actively responds to other properties in the vicinity ensuring no unacceptable impacts on residential amenity occur.

e) Not resulting in unacceptable harm to the amenities of existing and proposed buildings, particularly with regard to privacy, outlook, daylight and sunlight.

10.2 DEVELOPMENT SUSTAINABILITY FEATURES

The proposed development shall include a variety of features which are regarded as having a good sustainable design. It is anticipated that any external lighting specified will be designed to reduce unnecessary light pollution during night time hours.

To ensure the risk of potential overheating is minimised building modelling of the unit has confirmed that no occupied space is at risk from excessive solar gains; this being achieved through use of glazing with a low shading coefficient. Additionally, to ensure that overheating will not occur during summer months and the building is

suitably insulated as well as allowing for adaptation due to the effects of climate change, it is anticipated that the development will use building fabrics with enhanced 'U' values which go beyond the minimum requirements of Part L (2021), as seen within Table 10.1. Further to this the energy efficiency measures discussed within Section 6.0 will be incorporated into the design of the development. It is anticipated that such measures will lower the building's energy requirements making its operation feasible and practical for years to come.

Element	Part L Requirement	U Value Specified	% Improvement
Wall	0.26	0.22	15.39%
Roof	0.16	0.15	6.25%
Floor	0.18	0.18	N/A
Glazing	1.6	1.2	25%

Table 10.1 U Value Improvements

To provide a fully sustainable development it is also anticipated that the materials used for the following main elements of the development shall be rated under the Green Guide to Specification targeting ratings between A+ and D:

- *External walls;*
- *Ground floor;*
- *Roof;*
- *Windows.*

To provide a development which remains sustainable during its operation phase, it is anticipated that space will be provided for the provision of waste storage facilities with additional space of recyclable waste streams. This is to enable building users to sort waste before collection and minimise the quantity of waste that may end up at landfill.

10.3 SUMMARY

In order to comply with national and local policies, the development shall strive to provide both to building users and the local community a building of sustainable design.

Measures should be taken to ensure the thermal comfort of future building users, through efforts such as ensuring no occupied areas will result in excessive solar gains and in turn over heating.

External lighting except safety and security lighting should be designed to be switched off automatically through the use of timers of day light sensors as well as the specification of cut off luminaires to reduce any potential light spill on to neighbouring properties as covered in the lighting assessment.

The above design features allow for the proposed development to be of sustainable design.

11 FLOOD RISK

To prevent an increase in surface water run off through development of a site, it is imperative that consideration is given to the reduction of over land flow during storm events as well as the impact of development in potential flood risk areas.

11.1 POLICY REVIEW

National Planning Policy Framework (2023)

Section 14- Meeting the Challenge of Climate Change, Flooding and Coastal Change

165: Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.

Core Strategy Development Plan Document (2012-2027)

Policy EN 14: Flood Risk

- In line with the risk-based sequential approach contained within PPS25, development should be directed away from sites at the greatest risk of flooding, and towards sites with little or no risk of flooding; this should take account of all sources of flooding identified in the Manchester-Salford Trafford Strategic Flood Risk Assessment (SFRA).
- In addition to the requirements for site-specific Flood Risk Assessments (FRAs) set out in PPS25, an appropriate FRA will also be required for all development proposals, including changes of use, on sites greater than 0.5ha within Critical Drainage Areas (CDAs) and Canal Hazard Zones identified in the SFRA.
- All new development should minimise surface water run-off, including through Sustainable Drainage Systems (SUDS) and the appropriate use of Green Infrastructure. Developers should have regard to the surface water run-off rates in the SFRA User Guide. In CDAs, evidence to justify the surface water run off approach / rates will be required.
- The City of Manchester contains many sections of rivers which are culverted or 'hidden'; where these are indicated in the SFRA beneath the proposed development site, further investigation will be required and the development proposal should take this into account; where feasible and appropriate development should seek to open up culverted/hidden rivers to reduce the associated flood risk and danger of collapse, taking advantage of opportunities to enhance biodiversity and Green Infrastructure.

11.2 DEVELOPMENT SUSTAINABILITY FEATURES

The flood map sourced from The Government Flood Warning Information Service seen below in Figure 11.1, demonstrates that the proposed site is predominantly located within Flood Zone 1 and as such is not at risk of flooding from fluvial or surface water sources.

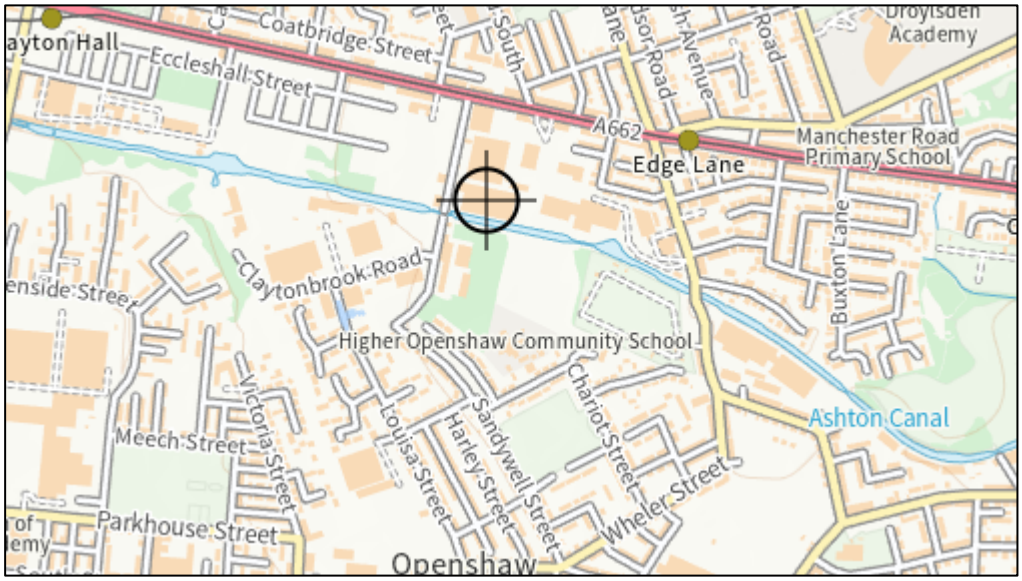


Figure 11.1: Fluvial Flooding (Sourced from Flood Warning Information Service)

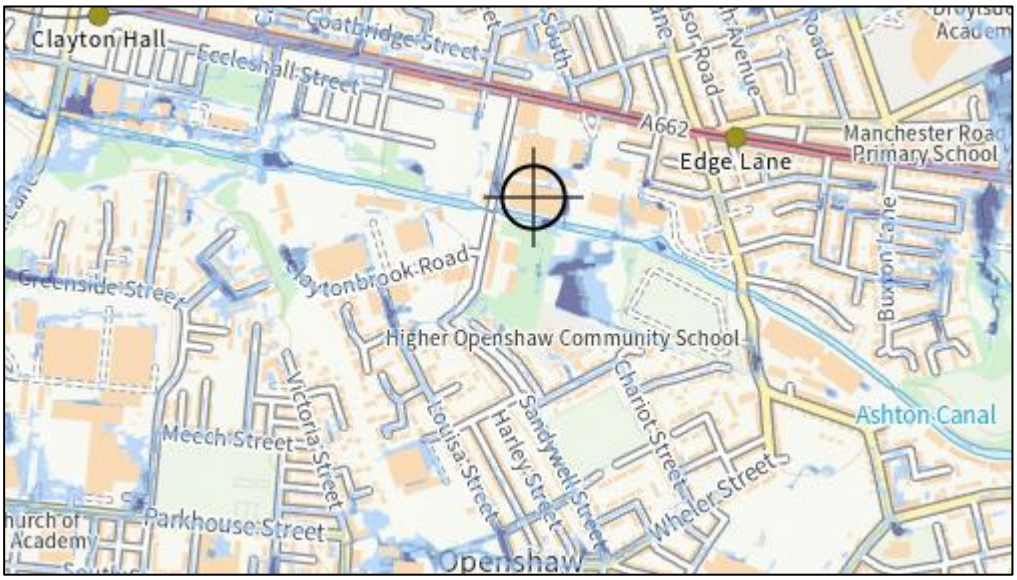


Figure 11.2: Surface Water Flooding (Sourced from Flood Warning Information Service)

11.3 SUMMARY

The above maps confirm that the site is located within Flood Zone 1 and is not at risk from fluvial or reservoir flooding.

12 NOISE

Noise is a subjective concept that can affect people differently, however there are set standards as to acceptable levels of noise, for different areas and times of day. In this instance, the proposed development would be subject to potential noise pollution from road sources.

POLICY REVIEW

National Planning Policy Framework (2023)

Section 15- Conserving and Enhancing the Natural Environment

180: Planning policies and decisions should contribute to and enhance the natural and local environment by:

a) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability.

12.1 DEVELOPMENT SUSTAINABILITY FEATURES

The proposed development is not subject to extreme noise pollution from road and rail sources, as can be seen in figure 12.1. It should be noted that the noise levels are 'A' weighted and as such only demonstrate sounds on a frequency that would affect human populations, it does not consider noise on frequencies that may affect any local habitats.

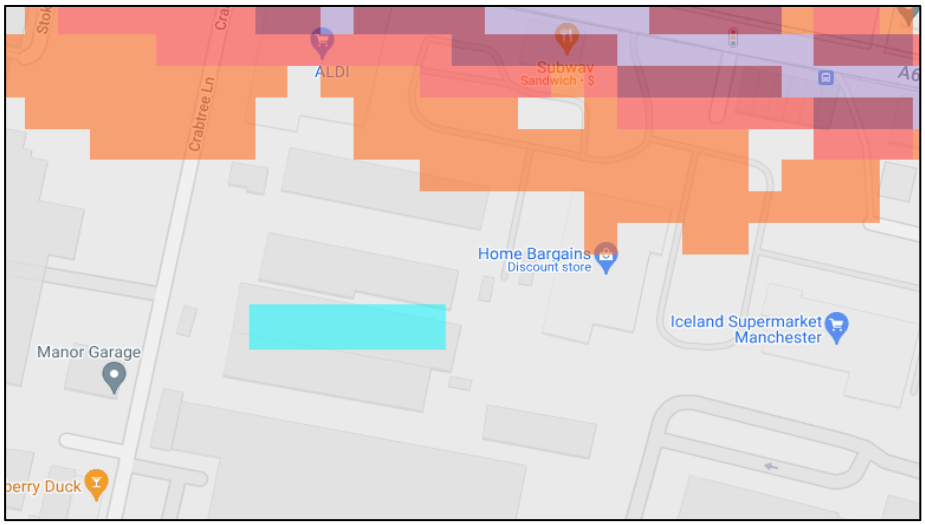


Figure 12.1: Road Noise Data Map (Postal Code Analysis, Sourced from Extrium)

12.2 SUMMARY

The development would not be subject to sources of noise pollution from the surrounding roads or from rail sources and that there are no noise impacts generated by the development.

13 ECOLOGY

Ecology is essential within many communities, with the mix of flora and fauna facilitating benefits such as flood alleviation and pollution amelioration. In addition to this, areas with a wealth of green spaces and an abundance of biodiversity are seen to provide a positive contribution to a community.

13.1 POLICY REVIEW

National Planning Policy Framework (2023)

Section 15- Conserving and Enhancing the Natural Environment

The planning system should protect and enhance valued landscapes, minimise impacts on biodiversity.

Core Strategy Development Plan Document (2012-2027)

Policy EN 15: Biodiversity and Geological Conservation

The Council will seek to maintain or enhance sites of biodiversity and geological value throughout the City. Particular consideration will be given to:

- sites with international or national designations for their biodiversity value. Manchester contains one Site of Special Scientific Interest (SSSI) (Cotteril Clough); there is a Special Area of Conservation (SAC) and an SSSI just over the border in Oldham (both on the Rochdale Canal within Oldham);
- other sites of biodiversity value, including Sites of Biological Importance (SBIs) and Local Nature Reserves (LNRs); Manchester currently has 35 SBIs (including the Rochdale and Ashton Canals) and 7 LNRs; priority habitats found within Manchester, as listed in the Manchester Biodiversity Strategy and included in the Greater Manchester Biodiversity Action Plan (GM BAP);
- sites that are recognised for their geological importance;

13.2 DEVELOPMENT SUSTAINABILITY FEATURES

The proposed development is far from the nearest Site of Special Scientific Interest (SSSI) as shown below in Fig 13.1. The nearest SSSI is Hollinwood Branch Canal, which is approximately 3 miles away from the development.

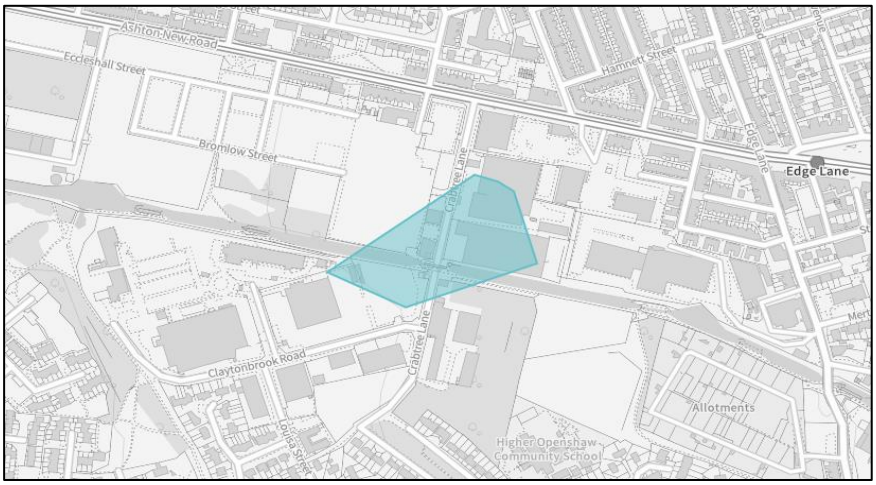


Figure 13.1 Ecological Sensitivity (Sourced from MAGIC)

13.3 SUMMARY

An Ecology conservation map (sourced from MAGIC) highlights there are no Sites of Special Scientific Interest (SSSI) in the vicinity of the site development.

14 AIR QUALITY

Air quality is a concept that refers to the condition or cleanliness of the air in a specific environment, typically measured by the concentration of various pollutants and the presence of harmful substances.

POLICY REVIEW

Core Strategy Development Plan Document (2012-2027)

Policy EN 16: Air Quality

The Council will seek to improve the air quality within Manchester, and particularly within Air Quality Management Areas, located along Manchester's principal traffic routes and at Manchester Airport. Developers will be expected to take measures to minimise and mitigate the local impact of emissions from traffic generated by the development, as well as emissions created by the use of the development itself, including from Combined Heat and Power and biomass plant.

When assessing the appropriateness of locations for new development the Council will consider the impacts on air quality, alongside other plan objectives. This includes cumulative impacts, particularly in Air Quality Management Areas.

14.1 DEVELOPMENT SUSTAINABILITY FEATURES

The air quality map seen in Figure 14.1 (sourced from the Environment Agency) confirms that there are no breaches in air pollution within close proximity to the development location. The Environment Agency analysis reviews emission levels from the following pollutants:

- Carbon dioxide;
- Dioxins;
- Nitrogen oxides;
- Particulates (PM10);
- Sulphur oxides.



Figure 14.1 Air Quality Map (Sourced from Environment Agency)

14.2 SUMMARY

The above Air Quality Map in figure 14.1 confirms that development is located in an area which has acceptable quality of air. Hence the proposed development can be deemed sustainable with regard to air quality.

APPENDIX A – FLOOD RISK MAP

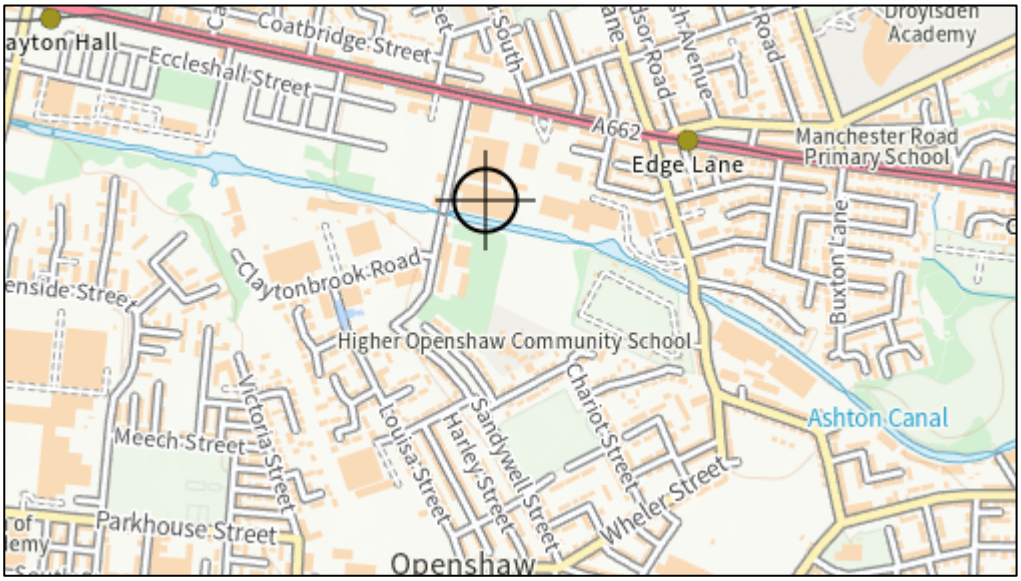
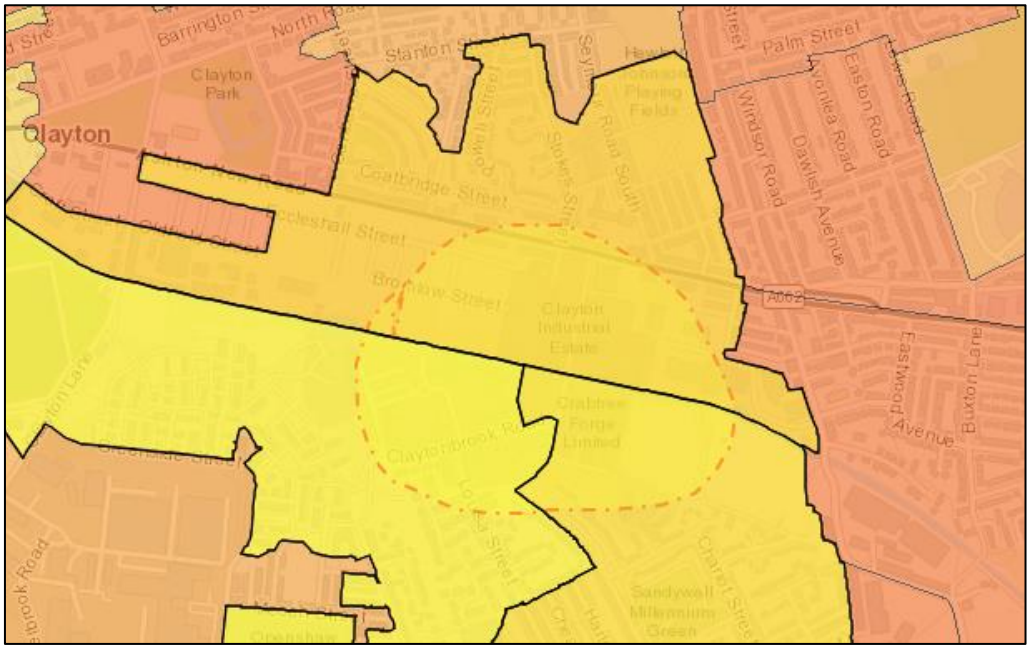


Figure 11.1: Fluvial Flooding (Sourced from Flood Warning Information Service)

APPENDIX B – CHP SEARCH



CHP availability Search Area

The table below shows the sector totals within your search area.

Sector Name	Share	Total MWh
Communications and Transport	0.28%	83 MWh
Commercial Offices	0.85%	251 MWh
Domestic	71.19%	20,972 MWh
Education	0.77%	226 MWh
Government Buildings	7.32%	2,156 MWh
Hotels	0.58%	171 MWh
Large Industrial	0%	0 MWh
Health	0%	0 MWh
Other	0%	0 MWh
Small Industrial	16.32%	4,809 MWh
Prisons	0%	0 MWh
Retail	1.62%	477 MWh
Sport and Leisure	0%	0 MWh
Warehouses	1.06%	313 MWh
District Heating	0%	0 MWh
Total heat load in Area		**29,458 MWh**

Total Heat Load Distribution

APPENDIX C – WIND MAP



Chart C.1 Wind Velocity Chart for the Development Site

APPENDIX D – ENERGY CALCULATIONS

Baseline

kWh/m²/annum Baseline											
Typical Unit	Area	Heating	Cooling	Auxillary	Lighting	Hotwater	Total	kWh/Annum	kgCO2/m²/ Annum	Total kgCO2/ Annum	Total TonsCO2/ Annum
Unit 1	1,807.90	6.60	2.05	0.53	31.65	4.24	14.58	26,359.18	2.36	4,266.64	4.27
Unit 5	1,241.00	13.46	1.31	0.77	27.68	3.80	20.16	25,018.56	3.22	3,996.02	4.00
Unit 6	454.00	23.41	1.55	1.22	28.75	3.63	33.53	15,222.62	5.20	2,360.80	2.36
Unit 7	373.00	20.88	1.39	1.20	30.92	3.46	30.08	11,219.84	4.73	1,764.29	1.76
Unit 8	372.00	20.94	1.38	1.20	31.18	3.46	30.33	11,282.76	4.77	1,774.44	1.77
Unit 9	372.00	31.36	1.41	1.22	30.27	3.48	35.65	13,261.80	5.65	2,101.80	2.10
Total	4,619.90							102,364.76			16.26

Passive + ASHP + PV

kWh/m²/annum Baseline with Passive/Energy Efficiency Measures/ASHP/PV												
Typical Unit	Area	Heating	Cooling	Auxillary	Lighting	Hotwater	Total	kWh/Annum	kgCO2/m²/ Annum	Total kgCO2/ Annum	Total TonsCO2/ Annum	Energy Produced from PV
Unit 1	1,807.90	6.60	2.05	0.53	26.38	4.24	9.31	16,831.55	1.63	2,946.88	2.95	30.49
Unit 5	1,241.00	13.93	1.27	0.77	20.76	3.80	13.00	16,133.00	2.25	2,797.21	2.80	27.53
Unit 6	454.00	24.07	1.51	1.22	21.56	3.63	25.20	11,441.94	3.64	1,652.56	1.65	26.79
Unit 7	373.00	21.58	1.35	1.20	23.19	3.46	20.22	7,542.06	3.31	1,235.00	1.24	30.56
Unit 8	372.00	21.65	1.34	1.20	23.39	3.46	20.39	7,583.22	3.34	1,242.11	1.24	30.65
Unit 9	372.00	32.12	1.37	1.22	22.70	3.48	26.19	9,743.61	3.96	1,471.26	1.47	34.70
Total	4,619.90							69,275.37			11.35	

Carbon Emissions

Carbon Calculations (Regulated Carbon Demands) Carbon						
Typical Unit	Total Area	Carbon Baseline kgCO2/annum	Improved Emissions after Passive/Energy Efficiency + ASHP + PV (kgCO2 /annum)	Total kgCO2/ annum displaced	Total TonsCO2/ annum displaced	Total % TonsCO2/ annum displaced
Unit 1	1807.90m²	4266.64	2,946.88	1319.77	1.319767	30.93
Unit 5	1241.00m²	3996.02	2,797.21	1198.81	1.198806	30.00
Unit 6	454.00m²	2360.80	1,652.56	708.24	0.70824	30.00
Unit 7	373.00m²	1764.29	1,235.00	529.29	0.529287	30.00
Unit 8	372.00m²	1774.44	1,242.11	532.33	0.532332	30.00
Unit 9	372.00m²	2101.80	1,471.26	630.54	0.63054	30.00
Total	4,620	16,264	11,345	4,919		30.24

Energy Demand

Energy Calculations (Regulated Energy Demands) Energy					
Typical Unit	Total Area	Energy Baseline (kWh/annum)	Total Energy with Passive/Energy Efficiency + ASHP + PV Measures (kWh /annum)	Total Displaced Energy from Baseline (kWh/annum)	Total % kwh/annum displaced
Unit 1	1807.90m²	26359.18	16831.55	9527.63	36.15
Unit 5	1241.00m²	25018.56	16133.00	8885.56	35.52
Unit 6	454.00m²	15222.62	11441.94	3780.69	24.84
Unit 7	373.00m²	11219.84	7542.06	3677.78	32.78
Unit 8	372.00m²	11282.76	7583.22	3699.54	32.79
Unit 9	372.00m²	13261.80	9743.61	3518.19	26.53
Total	4,620	102,365	69,275	33,089	32.32

APPENDIX E – SAMPLE BRUKL

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Crabtree Lane, Manchester Unit 1

As designed

Date: Thu Aug 22 16:57:26 2024

Administrative information

Building Details

Address: Crabtree Lane, Manchester, Unit 1,

Certifier details

Name: Sushil Pathak

Telephone number: 01344 628821

Address: Cudd Bentley, Ashurst Manor, Sunninghill, SL5 7DD

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.d.0

Interface to calculation engine: Energy Simulator

Interface to calculation engine version: 10.10.0.199

BRUKL compliance module version: v6.1.d.0

Foundation area [m^2]: 216.7

The CO_2 emission and primary energy rates of the building must not exceed the targets

Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	2.36	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	1.63	
Target primary energy rate (TPER), $kWh/m^2.annum$	24.42	
Building primary energy rate (BPER), $kWh/m^2.annum$	15.43	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.22	0.22	Partition 1
Floors	0.18	0.18	0.18	Exposed Floor 1
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	0.15	0.15	Exposed Roof 1
Windows** and roof windows	1.6	1.2	1.2	Window 1
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	-	-	No external personnel doors
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [$W/(m^2K)$] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [$W/(m^2K)$]

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [$W/(m^2K)$]

* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m^2K

NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air permeability	Limiting standard	This building
$m^3/(h.m^2)$ at 50 Pa	8	5

Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	<0.9

1- Office

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	3.5	5	-	-	-
Standard value	2.5*	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

2- WC

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	1	-	-	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

3- Circulation Area

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	1	-	-	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- Default DHW

	Water heating efficiency	**Storage loss factor [kWh/litre per day]**
This building	1	-
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	**System type in the Approved Documents**
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter
NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.	

Zone name	**SFP [W/(l/s)]**									**HR efficiency**	
ID of system type	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	**Zone**	**Standard**
OFFICE	-	-	-	-	1.1	-	-	-	-	0.8	N/A
WC	-	-	0.3	-	-	-	-	-	-	-	N/A

General lighting and display lighting	General luminaire	Display light source	
Zone name	**Efficacy [lm/W]**	**Efficacy [lm/W]**	**Power density [W/m²]**
Standard value	95	80	0.3
OFFICE	35	-	-
WC	110	-	-
CIRC	110	-	-
WH	160	-	-

The spaces in the building should have appropriate passive control measures to limit solar gains in summer

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
OFFICE	NO (-55.1%)	NO
CIRC	N/A	N/A
WH	NO (-91.4%)	NO

Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m^2]	1807.9	1807.9
External area [m^2]	5804.7	5804.7
Weather	MAN	MAN
Infiltration [m^3/hm^2@ 50Pa]	5	5
Average conductance [W/K]	1171.1	1777.33
Average U-value [W/m^2K]	0.2	0.31
Alpha value* [%]	61.09	28.21

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% Area	Building Type
	Retail/Financial and Professional Services
	Restaurants and Cafes/Drinking Establishments/Takeaways
	Offices and Workshop Businesses
	General Industrial and Special Industrial Groups
100	**Storage or Distribution**
	Hotels
	Residential Institutions: Hospitals and Care Homes
	Residential Institutions: Residential Schools
	Residential Institutions: Universities and Colleges
	Secure Residential Institutions
	Residential Spaces
	Non-residential Institutions: Community/Day Centre
	Non-residential Institutions: Libraries, Museums, and Galleries
	Non-residential Institutions: Education
	Non-residential Institutions: Primary Health Care Building
	Non-residential Institutions: Crown and County Courts
	General Assembly and Leisure, Night Clubs, and Theatres
	Others: Passenger Terminals
	Others: Emergency Services
	Others: Miscellaneous 24hr Activities
	Others: Car Parks 24 hrs
	Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m^2]

	Actual	Notional
Heating	6.6	3.84
Cooling	2.05	0.78
Auxiliary	0.53	0.5
Lighting	26.38	13.87
Hot water	4.24	4.24
Equipment*	31.68	31.68
TOTAL**	**39.79**	**23.24**

* Energy used by equipment does not count towards the total for consumption or calculating emissions.
** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m^2]

	Actual	Notional
Photovoltaic systems	30.49	6.97
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*30.49*	*6.97*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	277.26	303.83
Primary energy [kWh/m^2]	15.43	24.42
Total emissions [kg/m^2]	1.63	2.36

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	61	255.9	5.2	20	4.6	3.26	3.55	3.5	5
	Notional	102.1	121.7	10.7	7.7	3.8	2.64	4.4	----	----
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
	Actual	1193.9	0	414.5	0	6.6	0.8	0	1	0
	Notional	878.8	34.8	182.2	0	13.1	1.34	0	----	----
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
	Actual	789.3	13.3	274	0	0	0.8	0	1	0
	Notional	622	72.3	128.9	0	0	1.34	0	----	----
[ST] No Heating or Cooling										
	Actual	212.3	45.9	0	0	0	0	0	0	0
	Notional	232.2	71	0	0	0	0	0	----	----

Key to terms

Heat dem [MJ/m2]	= Heating energy demand
Cool dem [MJ/m2]	= Cooling energy demand
Heat con [kWh/m2]	= Heating energy consumption
Cool con [kWh/m2]	= Cooling energy consumption
Aux con [kWh/m2]	= Auxiliary energy consumption
Heat SSEFF	= Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER	= Cooling system seasonal energy efficiency ratio
Heat gen SSEFF	= Heating generator seasonal efficiency
Cool gen SSEER	= Cooling generator seasonal energy efficiency ratio
ST	= System type
HS	= Heat source
HFT	= Heating fuel type
CFT	= Cooling fuel type