



**ELEMENT
SUSTAINABILITY**

NORMAN ROAD, ROCHDALE

ENERGY AND SUSTAINABILITY STATEMENT

MARCH 2023

REF: 2023.011



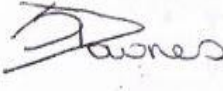
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ELEMENT
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ELEMENT SUSTAINABILITY

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1. INTRODUCTION

Element Sustainability has been commissioned by 1618 Architects to review the sustainability performance of the proposed Norman Road industrial units, within the Borough of Rochdale.

The purpose of this statement is to summarise the relevant policy background and requirements of Rochdale Council (hereafter referred to as the Council) and to demonstrate the ways in which the developer has addressed these aims through their proposals, ensuring all practicable measures have been taken in order to deliver a sustainable development at this site.

Details of the design attributes, specifications and characteristics of the scheme are appraised in order to demonstrate how the proposals contribute to sustainable development in Rochdale and seek to mitigate the environmental impacts of the scheme, providing a sustainability appraisal in support of the planning application.

This report is intended to support the planning application for this development and therefore, establishes an approach to the delivery of this scheme which meets the criteria outlined by the Council that the developer commits to implement at the site.



2. DEVELOPMENT PROPOSALS

2.1 Development Site Description

The application site is situated within a commercial area west of Rochdale town centre and currently comprises an MOT centre and associated car parking.

The plot is bound by Norman Road to the east, a wooded area associated with Mandale Park to the south, Corporation Road to the west and a large industrial building and car scrap yard are to the north.

The site is not considered to be in a designated conservation area and there is minimal vegetation within the site boundary.

Figure 2.1 – Pre-developed site



Figure 2.2- Site Plan



2.2 Development Proposals

Planning approval is sought for the redevelopment of the existing site to provide seven industrial units, totalling one-thousand-nine-hundred and twenty-seven square metres (GIFA). The site will also provide thirty-nine car parking spaces.

The following table shows the total floor area for each unit.

Table 3.1 – Total Floor Area per Unit

Unit	Floor Area (m ²)
Unit 1	335
Unit 2	350
Unit 3	300
Unit 4	300
Unit 5	300
Unit 6	152
Unit 7	190
Total	1,927

Figures 2.3 to 2.7 below demonstrate the proposed floor plans and elevations for the development.



Figure 2.3 – Proposed Unit 1 Front Elevation



Figure 2.4 – Proposed Unit 2 Front Elevation



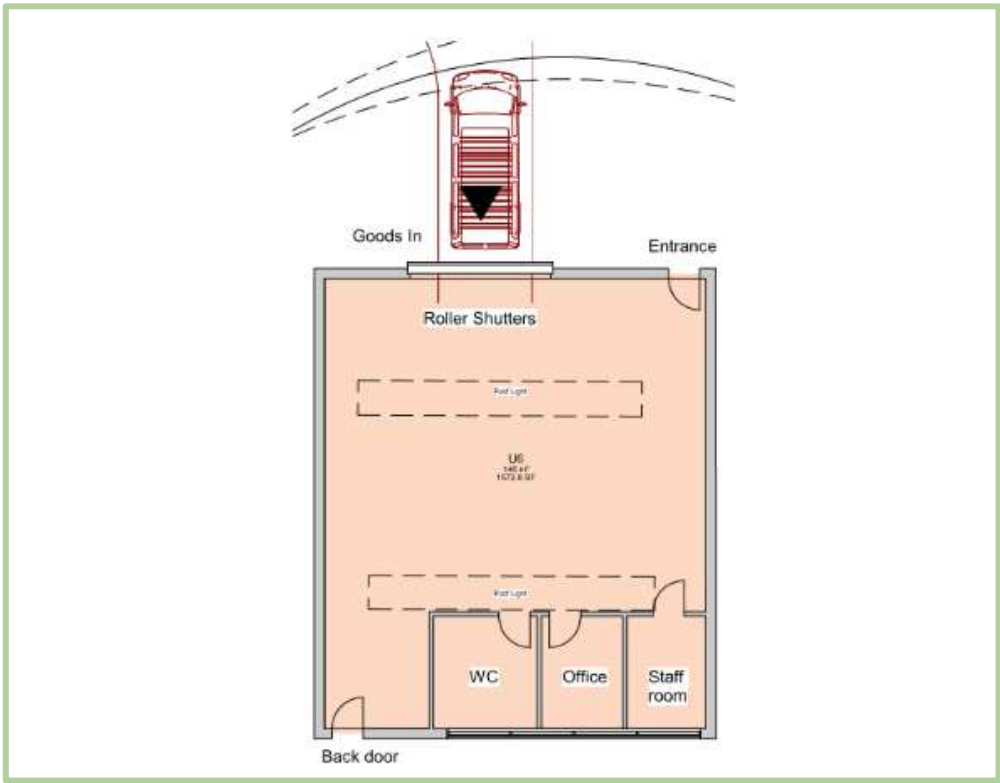
Figure 2.5 – Proposed Units 3,4 and 5 Front Elevation



Figure 2.6 – Proposed Site Ground Floor Plan



Figure 2.7 – Typical Unit Floor Plan



3. POLICY REVIEW

3.1 National Planning Policy

The National Planning Policy Framework (NPPF) 2021 states that the planning system should play an active role in guiding development to sustainable solutions. At the heart of the 2021 updated NPPF lies the ‘presumption’ in favour of sustainable development. There are three dimensions to sustainable development, as stated within the NPPF: economic, social, and environmental. These dimensions give rise to the need for the planning system to perform a number of roles:

An economic role – contributing to building a strong, responsive, and competitive economy, by ensuring that sufficient land of the right type is available in the right places and at the right time to support growth and innovation; and by identifying and coordinating development requirements, including the provision of infrastructure;

A social role – supporting strong, vibrant, and healthy communities, by providing the supply of housing required to meet the needs of present and future generations; and by creating beautiful and safe places, with accessible local services that reflect the community’s needs and support its health, social and cultural well-being; and

An environmental role – contributing to protecting and enhancing our natural, built, and historic environment; and, as part of this, helping to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate and adapt to climate change including moving to a low carbon economy.

These dimensions are considered to be mutually dependent with the NPPF, in its entirety, defining sustainable development. The NPPF states that ‘the purpose of the planning system is to contribute to the achievement of sustainable development’ (paragraph 7). It summarises the objective of sustainable development as meeting the needs of the present without compromising the ability of future generations to meet their needs. It goes on to state that at a similarly high level, members of the United Nations – including the United Kingdom – have agreed to pursue the 17 Global Goals for Sustainable Development in the period to 2030. These address social progress, economic well-being, and environmental protection.

3.2 Local Planning Policy

3.2.1 Rochdale Adopted Core Strategy

The Core Strategy for the Rochdale borough was adopted on 19th October 2016 and is the lead document in the Local Plan. All other documents that make up or support the Local Plan need to meet the vision, strategies and policies outlined in the Core Strategy. Therefore, the following policies are relevant to the proposed scheme:

C6 - Improving health and wellbeing: The council commits to improve people’s health and wellbeing and reduce health inequalities by:

- Managing and mitigating the effects of climate change by tackling greenhouse emissions, reducing risks of flooding, promoting tree planting and seeking to avoid adverse micro-climates;



- Maintaining and enhancing the borough's biodiversity, natural environment, open spaces and outdoor sport and recreational areas to create a coherent network of green infrastructure that can help promote better health;
- Identifying and implementing measures to reduce traffic movements and congestion to reduce air and noise pollution; and,
- Encouraging development that promotes active living by making places more accessible by walking, cycling and public transport.

P3 - Improving design of new development: The council will require all new developments, including associated landscaping, regardless of location in the borough, to adhere to high standards of design. The following design principles should be adhered to wherever relevant:

- Ensure a development is easy to move through and get around, especially for pedestrians, cyclists, public transport, disabled people and emergency service vehicles;
- Minimise impact upon the environment, and help adapt to the impacts of climate change, by re-using existing buildings and materials (maximising the benefits of existing embodied energy) and utilising sustainable drainage; and,
- Reduce the monotony and visual impact of car parking areas by using substantial and well-integrated landscaping.

G1 - Tackling and adapting to climate change: The Council will address climate change and ensure growth does not increase CO₂ emissions by:

- Locating growth in areas which are likely to minimise the need for travel and which are well served by public transport, services and infrastructure;
- Expecting all development and regeneration schemes to be well connected to surrounding areas and facilities by sustainable means of transport;
- Encouraging and promoting renewable energy developments, including standalone and community developments, that do not, by virtue of their scale, siting, construction or operation, cause harm to the local area, its character and environmental assets and adjoining uses, which cannot be mitigated;
- Promoting the efficient re-use of buildings, especially those of heritage value, and the recycling of construction waste;
- Ensuring that development does not cause unacceptable harm to the borough's peatlands and woodlands, and encouraging their restoration and responsible management;
- Promoting sustainable waste management through the operation of policies in the Core Strategy and Greater Manchester Joint Waste Plan;
- Making the best use of open space to contribute to climate change mitigation and adaptation; and,
- Securing planning obligations for energy infrastructure and climate change adaptation measures.

New developments will be expected to:

- Be zero carbon in line with national targets and definitions;
- Adhere to the 'energy hierarchy' as outlined in policy G2, being designed in such a way that ensures that buildings require the minimum amount of energy to function over their lifetime;
- Reduce CO₂ emissions through the use of renewable and low carbon decentralised energy technologies and networks. This will be through both on-site provision in new developments and through connection to local networks;



- Address the impacts of climate change by incorporating comprehensive adaptation measures, including:
 - Suitable measures, such as urban greening, for tackling the 'urban heat island' effect;
 - Where possible, the opening up of covered and culverted sections of waterways and provision of new water features, to help cooling and provide biodiversity, landscape and flood prevention benefits;
 - The incorporation of appropriate water conservation and management measures, such as Sustainable Drainage Systems (SuDS), to ensure that the rate of run-off on 'greenfield' sites is not increased, and on 'brownfield' sites is significantly reduced, and avoids the use of impermeable surfaces;
 - The retention of existing trees wherever possible and the taking of all appropriate opportunities to plant trees and other suitable vegetation on site; and,
 - The incorporation of 'green roofs' wherever possible, such as on developments with flat roofs.

G2 - Energy and new development: All new development will be expected to adhere to the following energy hierarchy to the extent that policy G2 reflects national policy, targets and requirements for that type of development:

- Demand Reduction – Achieve the maximum possible reduction in demand for energy through building design (i.e. the use of passive systems). At the design stage of new developments, every effort should be made to ensure that buildings use as little energy as possible throughout their lifetimes, using siting, orientation, layout, construction and landscaping to optimise use of natural passive systems such as solar gain and natural lighting, shading, ventilation and cooling to minimise heating, cooling and lighting demands. Green roofs and green walls should be incorporated into developments wherever feasible.
- Energy efficiency and low / zero carbon technologies and networks – Design to maximize energy efficiency, and use on-site or linked low or zero carbon technologies or direct connection to a low or zero carbon heat source (not necessarily on-site).
- 'Allowable solutions' – use wider energy efficiency / CO₂ reduction measures, which could include developer contributions, to compensate for 'residual emissions' not addressed by the above points.

G6 - Enhancing green infrastructure: The council will sustain and enhance a green network to support growth and regeneration in the borough and provide a high-quality environment that meets the needs of our community and visitors to the borough by:

- Protecting and improving green spaces and water bodies, to ensure that their value to sustainable development and regeneration is maximised;
- Improve opportunities for recreation in urban areas and the countryside, improve opportunities for healthy lifestyles, and to help manage and respond to environmental risks such as flooding and the impacts of climate change; and,
- Ensure that the network supports the sustainable growth of the Greater Manchester city region and links with a wider Greater Manchester strategic green infrastructure network.

The council will protect, improve and create green infrastructure to help deliver strategic sustainable development priorities and meet local needs. Therefore, the council expect development proposals and other proposals affecting green infrastructure to:



- Be consistent with the above focus for green infrastructure and the wider local value that green infrastructure can have;
- Have regard to local landscape character and contribute to its conservation or enhancement;
- Avoid the loss of existing urban greenspace or features e.g. trees unless suitable alternative provision is made, it has limited value, and its development or change of use will help to meet other sustainability or local regeneration objectives;
- In the case of residential development, provide or contribute financially towards recreational open space, including maintenance, in accordance with the standards set out in the Provision of Recreational Open Space in New Housing Supplementary Planning Document (SPD);
- Take opportunities to improve access to, and the provision of, natural greenspace in accordance with local strategies and standards;
- Take opportunities to secure innovative solutions to the design of urban open space to widen its potential functions e.g. flood risk management, promoting urban wildlife or climate change adaptation;
- Not sever, or impede the key functions of designated greenspace corridors or river valleys, or detract from their natural, visual or recreational quality, but enhance their value and accessibility;
- Protect ancient woodlands and hedgerows, support new woodland and tree planting in new developments, and replace removed trees from a site at a ratio of 2:1; and,
- Take opportunities, where feasible, to improve the water quality and biodiversity of water bodies and their environs in compliance with the Water Framework Directive or equivalent.

G7 - Increasing the value of biodiversity and geodiversity: The council will ensure that sites and features of biodiversity and geodiversity importance are given full and appropriate recognition and protection. Opportunities for enhancing biodiversity and geodiversity, creating new sites and features of interest and improving opportunities for public enjoyment will be supported. No development should result in a net loss of biodiversity or geodiversity interest in the borough and overall development in the borough should result in a net gain.

The council will expect development proposals and improvements to:

- Protect and include existing biodiversity (including established biodiversity interest on brownfield land) within new developments, public realm and open spaces and meet the requirements of the Biodiversity and Development SPD, Greater Manchester and Local Biodiversity Action Plans;
- Protect and enhance existing features such as peatland, ponds, wetlands, reservoirs, mill lodges, trees, hedges, wooded areas, meadows, flora and fauna;
- Take opportunities to promote biodiversity and create new habitats through new development using landscaping and building and construction features wherever possible (e.g. ponds, species of vegetation, green roofs and walls, bat boxes, roof space, appropriate nest boxes and landscaping);
- Enhance strategic wildlife corridors and the most natural areas, to ensure that habitats and corridors are not fragmented by development;
- Improve access where appropriate to new or existing biodiversity interest for public enjoyment; and,
- Protect important geology and take opportunities to increase interest and accessibility.

G8 - Managing water resources and flood risk: The council will ensure that new development (including flood risk mitigation measures) does not lead to any of the following:

- Form of increased flooding locally or further downstream;



- Does not impede natural water and flood risk management;
- Is not detrimental to existing or potential flood storage areas;
- Contributes where possible to alleviating existing flood risk; and,
- Is well protected from flood risk and ensures prudent use of water resources.

The council will therefore require:

- Compliance with a 'sequential' approach to new development and flood risk, directing development away from areas of high risk, in accordance with the National Planning Policy Framework;
- Full regard to and compliance with the advice of the Environment Agency (or equivalent agency) and the objectives and priorities for flood risk management set out in the Local Flood Risk Management Strategy, including any mitigation measures recommended for particular sites;
- Full regard to the published evidence of local flood risk and its significance as included in Strategic Flood Risk Assessments, Surface Water Management Plans and other recognised sources of flood risk data and the production of additional Flood Risk Assessments (FRAs) as appropriate;
- Incorporation of appropriate measures for the management of surface and flood water, including flood storage areas, Sustainable Urban Drainage Systems (SUDS) and the protection of 'overland flow paths';
- Compliance with any Surface Water Management Plan or drainage strategies produced, such as for the identified critical drainage areas of Littleborough and Heywood;
- The avoidance of culverting, and support the opening up of existing culverts wherever possible;
- The incorporation of measures for the conservation of water to minimise potable water consumption, including rainwater collection measures, which should be integral to the design of buildings and spaces;
- Development that does not directly or indirectly lead to pollution of existing water resources such as watercourses and groundwater;
- The incorporation of measures to improve water quality; and
- The taking of opportunities to improve the habitat value of watercourses and water bodies.

G9 - Reducing the impact of pollution, contamination and land instability: The council will reduce all forms of pollution, contamination and land instability in the borough, by:

- Focusing on measures that reduce air pollution in Air Quality Management Areas, and other areas where pollution levels are unacceptable, particularly around motorways and main roads;
- Requiring that development does not have impacts that lead to an unacceptable increase in air, water, noise, light or other pollution;
- Requiring a Low Emissions Strategy (LES) where development requires a Transport Assessment, and in other circumstances as appropriate;
- Requiring that any risks arising from contaminated land or land instability, and appropriate actions to address these risks, are identified prior to any development taking place on that land and the identified actions taken;
- Requiring that any risk to surface water and ground water resources from the disturbance of contaminated land be ascertained and preventative measures devised and carried out; and,
- Using planning conditions or obligations to control pollution from new development, or the impact of pollution on new development.



G11 - Managing waste: The council will support sustainable waste management and ensure that Rochdale borough makes an appropriate contribution towards Greater Manchester's waste management needs. There the council will require:

- Promote the use of site waste management plans in major construction projects within the borough.

T2 - Improving accessibility: The council will improve accessibility by locating development where good access to public transport is available or can be provided, backed by measures to reduce the need for travel and effective provision for cyclists, pedestrians and people with impaired mobility. Development will be appropriately located to minimise the need to travel by car and the number and length of car trips made to access local amenities. Transport improvements will focus access to priority regeneration areas, e.g. town centres, housing regeneration areas and economic growth corridors.

The council will do this by:

- Requiring development and infrastructure proposals to satisfy the Council's accessibility hierarchy. This requires transport user needs to be considered and addressed in the following priority order:
 - People with impaired mobility and pedestrians;
 - Cyclists;
 - Public transport (Bus, Heavy and Light Rail) and "clean fuelled" vehicles;
 - Taxi, private hire vehicles;
 - Powered two wheeled vehicles;
 - Commercial traffic for local access;
 - Shopping, visitors / tourist and off peak traffic; and
 - Long stay and peak time commuter traffic.

DM1 - General development requirements: All development proposals, including changes of use of land and buildings, extensions and alterations, will be expected to demonstrate that they:

- Are of high quality design and take the opportunity to enhance the quality of the area;
- Mitigate against any impacts due to noise, air, dust, light and odour pollution, traffic generation or inadequate access, where such mitigation is identified as being necessary;
- Provide satisfactory vehicular access with adequate parking, manoeuvring, and servicing arrangements taking into account of the proposed use and location;
- Do not have an adverse impact on health, through its impact or the effect of existing problems;
- Minimise opportunities for crime against people or property;
- Incorporate, where appropriate, high-quality landscape schemes;
- Have considered the availability of water and wastewater infrastructure, and any need for additional capacity; and,
- Do not lead to impacts detrimental to the conservation interests of European Protected Sites.

3.3 Supplementary Planning Documents (SPD)

3.3.1 Climate Change Adaptation SPD

This document outlines actions for developments to help climate change adaptation under eight broad headings: location, layout and orientation, materials / structure, environmental performance, green



roofs and walls, rainwater harvesting, Sustainable Drainage Systems (SUDS) and green and blue infrastructure.

Flood Risk

- Development proposals should avoid areas of highest flood risk and in all cases development should be safe and not increase the level of flood risk on site, in adjacent areas or downstream of the development site;
- Proposals should take flood risk into account at all stages of preparation from site selection through to how development is delivered, used and managed in the future;
- Where necessary, development should include measures to ensure the appropriate protection of people, infrastructure, buildings and uses from flood risk and any hazard or disruption it may cause.
- Such measures could include adapting and organising site layout to protect more vulnerable uses, use of new or enhanced flood defences, sustainable drainage systems and the use of green infrastructure.

Layout and Orientation

Proposals for new developments will be expected to demonstrate how the overall layout and massing of the development:

- Does not increase the flood risk and where possible reduces risk;
- Utilises passive systems such as orientation and solar gain to control building temperatures;
- Orientates streets and open spaces in a way that takes climate change into account;
- Maximises natural ventilation; and,
- Shows that the development has been designed around green space and natural vegetation / natural features.

Materials, Structure and Construction

New developments should:

- Be able to incorporate appropriate ventilation and cooling techniques / mechanisms; and,
- Maximise the insulation and air tightness of the building envelope.

Environmental Performance (Buildings)

Applicants will be required to demonstrate how they have taken the following into account in the design of new buildings:

- Use of natural ventilation;
- Louvres and shutter systems;
- Provision of well-ventilated and cooled internal spaces;
- Appropriate storage of composting and waste in hot weather; and
- The provision of bird and bat boxes within and/or on new buildings.

Whole life costing techniques should be used; these can show long term savings. It is vital that this approach is used, otherwise the necessary environmental performance may not be achieved. For instance, the optimal integration of natural ventilation considerably reduces the amount of area



required for mechanical plant, and it removes the cost of supplying and installing ductwork, as well as yielding a saving in running costs.

Green Roofs and Walls

There will be a presumption that roofs on any buildings over five hundred metre squared for non-domestic buildings or any development of five or more residential houses will be green roofs. If it is not feasible to meet this requirement the onus is on the developer to persuade the planning authority that this is the case.

Water Efficiency

For non-domestic developments water consumption must be equal to or less than 4.4m³/person/year as calculated by the BREEAM Water Calculator Tool. Developers are free to choose how best to meet these requirements in their developments though some suggested measures are included below.

Water Management

Sustainable Urban Drainage Systems (SUDS) must be specified to ensure no discharge to watercourses (natural or municipal). Developers should liaise with the Local Planning Authority and the Environment Agency, and SUDS should comply with national standards.

Green and Blue Infrastructure

Green infrastructure should be as much a priority for a successful place as other infrastructure such as roads; that is why it is vital that it is a fundamental consideration to be incorporated into the design of a development from the beginning.

All new development in the urban areas of the Borough, and new urban extensions, will therefore be expected to:

- Not sever or fragment the existing Green Infrastructure of the Borough; and,
- Increase the amount of Green Infrastructure. In particular, they must offer an accessible choice of shade and shelter, recognising the opportunities for people, biodiversity, flood storage and carbon management provided by multi-functional green spaces and green infrastructure networks.

3.4 Emerging Policies

3.4.1 Places for Everyone

The Draft 'Places for Everyone' (PfE) Plan is a new long-term plan of nine Greater Manchester districts (Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan) for jobs, new homes, and sustainable growth. It has been prepared by the Greater Manchester Combined Authority on behalf of the nine districts.

The Draft Plan will determine the kind of development that takes place across the city-region, maximising the use of brownfield land and urban spaces while protecting green belt land from the risk of unplanned development. It will also ensure all new developments are sustainably integrated into Greater Manchester's transport network or supported by new infrastructure.



On 1st March 2022, the Secretary of State appointed three planning inspectors to conduct an independent examination of the Places for Everyone Joint Development Plan document. The inspectors have since published a provisional hearings programme and list of participants. This identifies that hearings will start on Tuesday 1st November 2022 and run until Thursday 30th March 2023.

It is therefore considered that the plan is in an advanced stage of preparation.

3.5 Climate Emergency

In July 2019, Rochdale Borough Council declared a Climate Emergency and have acknowledged their responsibility to take meaningful action to reduce carbon emissions, alongside preparing the borough for the impacts of a changing climate.

The council have created a Climate Change Strategy in response to declaring a climate emergency, which identifies the actions required to achieve environmental sustainability.

The council have therefore committed to:

- Work towards ensuring that the Council and the borough of Rochdale is carbon neutral by 2038; and,
- Develop a working group to support the Council move from declaration to delivery, drawing in cross sector expertise, capacity and capability. The working group should draw on existing expertise within the borough as well as including residents who are representative of the borough as a whole.

3.6 Regulatory Framework

Building Regulations, Part L - Conservation of Fuel and Power sets the compliance standards for energy demand and carbon dioxide emissions from buildings. Guidance on how to meet the requirements of this regulation is provided within a number of approved documents. The relevant document is referenced below:

Approved Document Volume 2: In new buildings other than dwellings: Gives guidance on how to comply with Part L of Schedule 1 to the Building Regulations and the energy efficiency requirements for buildings other than dwellings. Part L 2021 standards are expected to achieve a 27% reduction in carbon emissions over the Part L2a 2013 regulations.

The minimum energy performance requirements shall be approved and expressed in accordance with the methodology for:

- a) New buildings (which shall include new dwellings), in the form of target CO₂ emission rates;
- b) New buildings, in the form of target fabric efficiency rates; and
- c) New buildings in the form of target primary energy rates.

3.7 Applicable Targets

Based upon a review of relevant planning policy requirements, legislative drivers, and client priorities, the following list provides a brief precis of the key criteria that should be targeted for this development:



Rochdale Core Strategy Policies

- **Policy C6** – Improving Health and Wellbeing
- **Policy P3** – Improving design of new development
- **Policy G1** – Tackling and Adapting to Climate Change
- **Policy G2** – Energy and New Development
- **Policy G6** – Enhancing Green Infrastructure
- **Policy G7** – Increasing the Value of Biodiversity and Geodiversity
- **Policy G8** – Managing Water Resources and Flood Risk
- **Policy G9** – Reducing the Impact of Pollution, Contamination and Land Instability
- **Policy G11** – Managing Waste
- **Policy T2** – Improving Accessibility
- **Policy DM1** – General Development Requirements

Climate Change Adaptation Supplementary Planning Document**Building Regulations, Part L - Approved Document Volume 2 (2021)**

4. SUSTAINABILITY STATEMENT

This section provides an appraisal of the development proposals and details the specific approach, design features and specifications which will contribute to reducing the environmental impact of this scheme. This section outlines those commitments that have been made to ensure this scheme contributes to sustainable development and aligns with the Council's Climate Change Adaptation SPD requirements.

4.1 Energy Improvements

In order to limit energy demand and carbon dioxide (CO₂) emissions from the operation of the building, a number of design features will be integrated that will collectively contribute towards the emissions reduction target for the scheme.

Detailed measures are presented in Section 6 of this report, but in essence, the energy strategy focuses on a holistic and multi-faceted approach towards improving the buildings' performance, by applying a high-quality fabric specification and through the means of efficient mechanical and electrical systems.

The reduction in energy demand to meet the carbon reduction targets will be achieved through the following design measures and low carbon technology options:

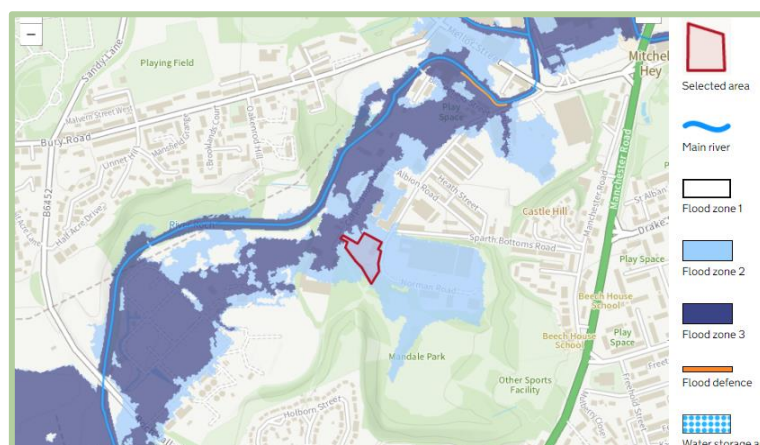
- High performance thermal insulation;
- Low air permeability;
- Heat recovery ventilation systems (MVHR).
- VRF Air source heat pumps

These measures will secure the carbon reduction targets sought by the local planning authority.

4.2 Flood Risk Management

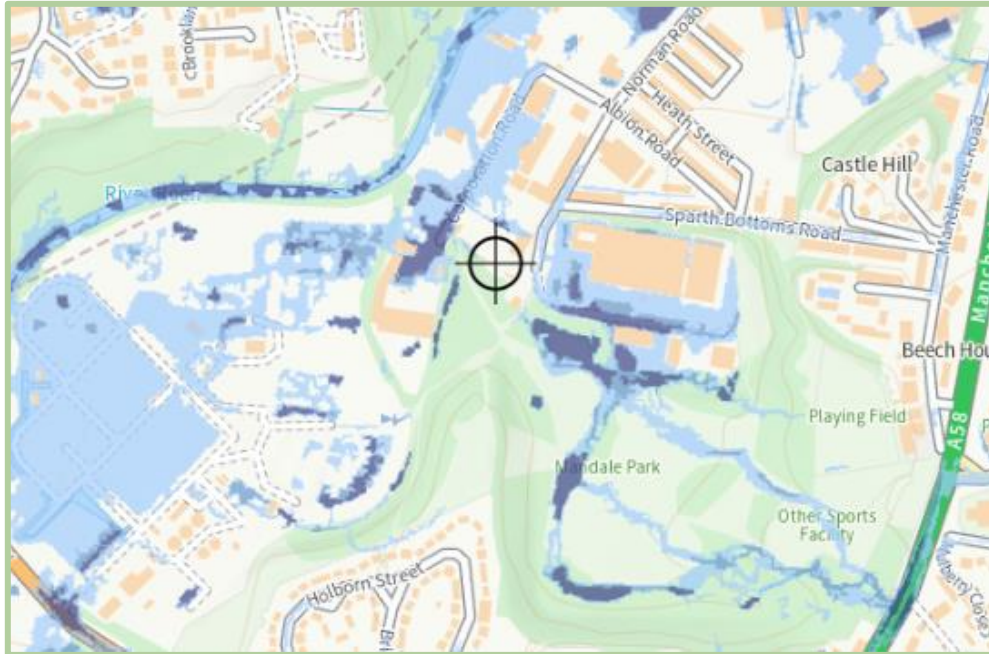
The latest Environment Agency (EA) Flood Zone Map data demonstrates that the site is predominantly located within Flood Zone 2. The probability of flooding is therefore considered to be of medium risk from river flooding, as demonstrated in Figure 4.1 below. The river Roch is within close proximity of the site and recent flood map data also shows that the site is located within an area that benefits from flood defences.

Figure 4.1 – Environment Agency Flood Risk Zone Map



The extent of flooding caused by surface water, is indicated in Figure 4.2 below. From this it can be determined that most of the site is predominantly located in an area which is classified as being at 'low' risk. However, certain sections of the site are considered to have a medium risk from surface water flooding.

Figure 4.2 - Extent of Flooding, Surface Water



Mitigation Measures –

- Finished floor levels will be set to a nominal three hundred millimetres above the one in one-hundred-year annual probability fluvial flood, including an allowance for climate change.

Employees will be **made fully aware of the flood risk and flood warning / evacuation processes** during an extreme event.

4.3 Layout Orientation

The proposed orientation of the development has been considered so not to negatively impact the site.

- The development will not increase the risk of flooding on site but is located in an area with a medium risk from river flooding; and,
- The units will be designed in order to optimizes solar gain and maximise natural ventilation where possible.

Emergency access points will be provided, and electrical services will be located above flood levels.



4.4 Materials, Structure and Construction

This development will contribute towards making more efficient use of non-renewable material resources, and to reducing the lifecycle impact of materials used in construction. This is demonstrated by the selection of:

- Building materials, will be specified to prevent heat penetration;
- The external envelope will be able to cope with potential increases in driving rain and wind speeds;
- Materials with low environmental impact throughout their lifecycle;
- Responsibly sourced materials from suppliers operating an Environmental Management System or procuring timber verified by either the Forest Stewardship Council (FSC) or Programme for the Endorsement of Forest Certification standard (PEFC);
- Local sourcing of construction materials where feasible and viable, will minimise the impact of carbon dioxide emissions associated with the transportation of materials;
- Material selection will be carefully considered to avoid the use of toxic materials, such as Volatile Organic Compounds (VOCs) and contribute towards creating a healthy indoor environment; and
- Excavated material (such as soil and substructural elements) from construction and demolition works will be used, where practical, for landscaping purposes.

The scheme will look to **maximise existing embodied energy where viable** in accordance with Core Strategy Policy P3

4.5 Environmental Performance

The proposed development will be designed to include the following measures, in order to improve the environmental performance of the buildings:

- Internal spaces will be well ventilated through predominantly natural ventilation measures;
- Bird and bat boxes will be installed to help improve the ecological status of the site; and,
- Whole life costing will be utilised to monitor and assess the possibility for long term savings.

Waste will be appropriately stored and segregated bins will be provided to optimise recycling rates.

4.6 Water Efficiency

The proposed development will be designed to reduce mains/potable water consumption and will include the following water efficient designs and equipment:

- Efficient water fixtures will be specified throughout the scheme (low flow taps and dual flush WCs);



- At present, appliances are graded on a scale from G (the least efficient) up to A++ (the most efficient). A water efficiency strategy will be determined for the site and will include for the provision of 'A' rated appliances as a minimum; and,
- A water meter on the mains water supply to the building will be specified to monitor and manage consumption; and,

In accordance with the **Climate Change Adaptation SPD**, the water consumption for this development will be equal to or less than 4.4m³/person/year, as calculated by the BREEAM Water Calculator Tool.

4.7 Water Management

Sustainable urban drainage systems such as rainwater butts, permeable paving and soakaway are feasible solutions for this development and will be considered as the design progresses in accordance with **Core Strategy Policy G8**.

In accordance with the **Climate Change Adaptation SPD**, sustainable urban drainage systems (SUDS) that comply with national standards will be specified to ensure no discharge to watercourses (natural or municipal).

4.8 Green and Blue Infrastructure

The development is considered to be in an urban area of the Borough, and will therefore comply with the following criteria in accordance with the Climate Change Adaptation SPD:

- Not sever or fragment the existing green infrastructure of the Borough; and
- Increase the amount of green infrastructure through offering an accessible choice of shade and shelter, and by recognising the opportunities for people, biodiversity, flood storage and carbon management provided by multi-functional green spaces and green infrastructure networks.

The green infrastructure provision for this new development has been quantified using the toolkit provided by the Council in Appendix Two of the Climate Change Adaptation Supplementary Planning Document. The results are presented in the Appendix of this report.

It has been determined that the Norman Road development is expected to **achieve a 0.065 uplift** in green infrastructure.

4.9 Ecology and Biodiversity

A Preliminary Ecological Appraisal has also been produced for the scheme by Amenity Trees Limited and from this the following conclusions can be drawn:

- Protected species that may be present on site include bats, badgers and hedgehogs;
- There are no statutory or non-statutory designated sites within the boundaries of the development site; and,
- The site is not likely to hold great significance for commuting and foraging bat species.



Recommendations –

- A breeding bird appraisal / survey will be required prior to any tree / building removal;
- A Bat Roost Assessment of all building areas to be removed is required; and,
- Upon completion of these surveys' mitigation, compensation and enhancement measures can be provided and confirmed.

Due to the pre-developed site being of negligible ecological value, the development will **incorporate ecological enhancing features** to generate a biological net gain on site.

4.10 Waste Management

Construction Waste

Best practice techniques to prevent and minimise waste during the design and construction phases of the development will be adopted, as follows:

Prior to commencement of the above ground construction phase, **a site waste management plan (SWMP) will be produced** by the developer to limit the on and off-site environmental impacts of construction **in accordance with Core Strategy Policy G11.**

- The SWMP will detail:
 - Recycled and secondary materials;
 - Waste reduction;
 - Waste segregation;
 - Waste recovery; and,
 - Waste disposal.
- This scheme will promote the minimisation of waste arising and seek to maximise the use of recycled materials in construction.

Operational Waste

The operational waste strategy for the scheme focuses on the segregation of waste at source, in order to maximise the potential for employees and visitors to recycle. All staff members will be informed on collection frequency, as well as guidance on recycling and health and safety practices related to the management and storage of waste will be provided.

The proposed strategy has been developed in compliance with the policies of Rochdale Council:

- Waste will be segregated at source with the help of segregated bins. It is expected that there will be multiple streams of waste – general, recyclables and compost;
- Staff members will be required to take their waste to the designated hardstanding refuse area, to be collected by refuse operators on the designated collection day. Staff members will then be responsible for returning the bins to the refuse storage areas; and,



- The number of bins and subsequently the size of the refuse store is based on waste generation figures for each building;

4.11 Pollution

To reduce the building's impact on surrounding communities and environments, the new build development proposals will include the following:

Impact of Refrigerants -

Predominantly heating and hot water is supplied by electric systems to reduce the site level greenhouse gas emissions. Therefore, avoiding the burning of fossil fuels and/or the leakage of refrigerants from building systems.

Reduction of Night-time Light Pollution –

- The external lighting strategy will be designed to reduce unnecessary light pollution through effective design, energy consumption.

4.12 Management

In order to minimise the impact of the development during project delivery and construction, whilst providing a safe place to work, the proposals include the following provision:

Project Brief and Design –

Stakeholder consultation covering project delivery and relevant third parties. This will encourage an integrated design process that optimises building performance.

Construction Site Impacts –

To recognise and encourage construction sites that are managed in an environmentally and socially considerate, responsible, and accountable manner, the following will be carried out/implemented during the construction phase:

- Site related energy and water impacts will be monitored and reported to ensure ongoing compliance during the Construction, Handover and Close Out stages and to improve awareness and understanding for future projects.

The **principal contractor will implement sound environmental management practices** and consideration for neighbouring sites during their activities on-site.

4.13 Transport

A transport assessment has been prepared by Iris Sustainable Planning and from this the following conclusions can be drawn:



- There will be thirty-nine vehicle parking spaces, including seven electrical vehicle charging points;
- Secure cycle parking will be provided for three bicycles and there will be space for two powered two wheelers;
- The proposed development will be located within a convenient walking and cycling distance of a wide range of services, shops and facilities on Bridge Street;
- There are footpaths linking the site to Mandale Park;
- The proposed development is located less than one kilometre walking distance of the bus stop on the A6060 Mellor Street;
- The nearest train station is within a seventeen minute walk from the site.

Overall, the proposed development will not have an adverse traffic impact on the local highway network and is in a **sustainable transport location**.



5. ENERGY STRATEGY

5.1 Energy Strategy

Details of the proposed energy strategy for this development, which includes efficient mechanical and electrical servicing and zero carbon technologies, will achieve compliance with the new build carbon dioxide emission reduction and fabric energy efficiency targets stipulated by Building Regulation, Part L Approved Document Volume 2 and Rochdale Borough Council's adopted planning policies.

5.1.1 Build Fabric and Thermal Performance

The standard measurement of heat transfer through a given building material or construction type is the U-value ($\text{W/m}^2\text{K}$); the lower the U-value, the more slowly heat transfers and is lost out of a building.

In buildings, heat loss generally occurs through the following areas and elements of the construction:

- Ground floor;
- External walls;
- Roofs;
- Doors and windows;
- Thermal (cold) bridging; and,
- Uncontrolled ventilation.

Table 5.1 presents the fabric parameters proposed for limiting heat loss and improving the building performance for the proposed industrial units.

Table 5.1 - Fabric Parameters

Construction Element	Proposed Fabric Specification
Ground Floor	$U=0.22 \text{ W/m}^2\text{K}$
External Wall	$U=0.26 \text{ W/m}^2\text{K}$
Roof	$U=0.18 \text{ W/m}^2\text{K}$
Windows	$U=1.40 \text{ W/m}^2\text{K}$, <i>Double Glazed</i>
Air Permeability	$5.0\text{m}^3/\text{hm}^2$ (@50Pa.)

These specifications and design attributes will provide the following benefits:

- **Upgraded thermal insulation** throughout the building envelope (ensuring very low U-values for all heat loss elements) and thermally efficient windows and doors will minimise heat loss through the main building elements;
- **Thermally efficient, double-glazed windows** will be specified with argon gas fill and low emissivity coatings to limit heat loss through the panes;
- **Low air permeability** of $5.0\text{m}^3/\text{hm}^2$ (@50Pa.) is targeted for this build in order to minimise uncontrolled ventilation. This will further reduce heat losses and provide high levels of occupant comfort (in combination with the proposed mechanical ventilation strategy). Focus on the quality of the build is vital to deliver such airtight buildings;



- **Attention to cold bridging junctions** including the provision of insulation to reduce heat and limit heat losses that occur at the junctions between building elements and around openings and will significantly improve the emission rate of the apartments.

This specification will help to deliver an energy efficient development that achieves an emission rate reduction and fabric energy efficiency significantly beyond the requirements set by Building Regulation Part L Approved Document Volume 2.

5.1.2 Building Services Specification

In addition to the improvements in the building fabric and thermal performance, a number of measures to improve the energy efficiency of the building systems have also been considered. The proposed mechanical and electrical specification that will be incorporated to ensure efficient servicing of the units is presented in Table 5.3.

Table 5.3 - Mechanical and Electrical Specification

Building Elements	Proposed Fabric Specification
Mechanical Ventilation	Local mechanical exhaust (to the WC)
Space Heating	Air Source Heat Pump – VRF (to staff room and office)
	Local time and temperature controls
Space Heating	Electric panel (to the WC)
Space Heating	Gas radiant (to the storage areas)
	Local time and temperature controls
Water Heating	Electric Point of Use (POU) (to the WC)
Water Efficiency	<110 litres / person / day
Lighting	100% Low energy LED

- **Mechanical ventilation** systems will be specified to the WC areas to further reduce the heat losses and the energy demand of the building. The design air permeability of 5.0m³/hm² (@50Pa.) for the development will virtually eliminate uncontrolled ventilation and ensure that the majority of the expelled stale air will pass across the heat exchanger, thereby boosting the energy reduction potential of these systems;
- **Air Source Heat Pumps (space heating)** are a low carbon solution that are ideal for non-residential spaces. They are a highly efficient method of producing heat as ASHPs collect low-grade heat from the air to supply useful heat for space heating requirements by applying additional energy input (in the form of electricity).
- **LED lighting** will be specified throughout the scheme to maximise operational efficiencies and lifespan of the fittings. LEDs operate with an estimated energy efficiency of up to 90% when compared to traditional lighting and conventional light bulbs. This means that c.90% of the electrical energy is converted to light, rather than wasted heat as in conventional bulbs; and
- **Sophisticated heating controls** including programmable appliance thermostats will ensure the efficient delivery of heat from electric panel heaters to further reduce the energy demand of the scheme.



5.2 Low and Zero Carbon Energy Provision

The enhanced fabric specification will be supplemented by renewable energy technology as part of the site wide energy strategy to optimise the on-site emission rate reductions. To ensure the selection of the most appropriate solution, several renewable energy technologies have been considered for this site, including:

- District Heating;
- Solar Hot Water (SHW);
- Photovoltaics (PV);
- Wind;
- Ground Source Heat Pumps (GSHP); and
- Biomass heating.

A review of the development proposals and site location concludes that two of these options are feasible for this scheme, as detailed in Table 5.4 below.



Table 5.4 – Renewable Energy Feasibility Study

Technology	Description	Advantages	Limitations	Feasibility
District Heating	District Heating systems provide multiple buildings or dwellings with heat and hot water from a central boiler house, or 'energy centre'. The system can provide heating or cooling which is transferred from the energy centre through a network of highly insulated pipes carrying the heated water to each dwelling.	✓ Efficient use of fuel. ✓ Eliminates the need for gas to be installed.	✗ Relies upon the installation of nearby heat networks.	No - it has been determined that there are no existing or proposed heat networks/ energy centres within a moderate radius from the development and there are no existing networks local to the site.
Photovoltaics (PV)	PV panels harness solar thermal energy and convert it into electricity which can then be used within a building. The panels may be roof or floor mounted.	✓ Low maintenance. ✓ Easy to integrate into building design. ✓ Cost of PV is constantly dropping.	✗ Panels ideally facing south at 30° tilt for optimum efficiency. ✗ Overshadowing will reduce performance. ✗ Can require significant roof space	No – This technology is considered to be a feasible option for this site, however it is not required to meet the carbon reduction targets of the scheme.



Solar Hot Water	The solar collector absorbs the radiant energy of the sun and converts it to heat energy for use as hot water in buildings.	✓ Feasible for small scale developments. ✓ Low maintenance.	✗ Panels ideally facing south at 30° tilt for optimum efficiency.	No - This technology is not considered to be a feasible option for this site because these solar thermal technologies make only a relatively limited contribution to reducing the building's energy demand and carbon dioxide emissions. Available roof space would be better utilised for PV panels which offer a superior energy yield and emissions reduction per pound (£) of capital expenditure. Furthermore, there are potential problems associated with routing the pipework through the dwellings.
Biomass heating	Biomass boilers typically burn wood chips or pellets as fuel to provide space heating and hot water.	✓ Almost a carbon neutral technology.	✗ Frequent and large fuel deliveries. ✗ Large fuel store required. ✗ Regular maintenance. ✗ Air quality issues in urban areas.	No – This technology is considered inappropriate for this type of development and location due to the requirement for a large fuel store and the high NOx emissions associated with biomass combustion, typically rendering these systems technically unfeasible for urban locations.
Wind	Wind generation equipment harness the wind to turn a propeller and in doing so, drive an alternator to generate electricity. The turbines may be pole or roof mounted.	✓ Low maintenance. ✓ Excess electricity can be exported to the grid. ✓ Vertical Axis Turbines able to operate at wind speeds as low as 2m/s.	✗ A wind speed of at least 6m/s is typically required for traditional turbines to operate efficiently. ✗ Visual and noise impact risk.	No – The NOABL wind speed database records a wind speed of approximately 3.9m/s at 10m above ground level for this site. In order to operate efficiently a wind speed of at least 6m/s is typically required. Furthermore, there are potential planning issues and perceived safety concerns with this technology.



Ground Source Heat Pumps (GSHP)	GSHPs collect low-grade heat from the ground to supply useful heat for space and water heating requirements by applying additional energy input (in the form of electricity).	✓ Flexible installation methods - vertical ground collector boreholes can be used when space is more limited. ✓ Can provide both heating and cooling as well as hot water.	✗ Full ground survey required to determine suitability/ geology. ✗ Large area required for horizontal ground collector loops. ✗ Prohibitive costs.	No – Such technology is considered unsuitable for this site due to prohibitive costs and technical complexity of installing the vertical ground collector boreholes within the site boundary.
Air Source Heat Pumps (ASHP)	ASHPs collect low-grade heat from the air to supply useful heat for space and water heating requirements by applying additional energy input (in the form of electricity).	✓ Highly efficient method of producing heat. ✓ Can provide both heating and cooling as well as hot water.	✗ Prohibitive costs. ✗ Internal and external unit space required. ✗ Potential noise issues from external plant.	Yes – This technology is considered to be a feasible option for this site.



5.3 Proposed Renewable Energy Solution

5.3.1 Air Source Heat Pump (VRF)

VRF Air source heat pumps will be specified within the staff room and office areas.

Air source heat pumps collect the warm air as it leaves the building via the ventilation system and then re-uses the heat that would otherwise be lost to the outside to heat fresh air coming into the building or to heat the water. The typical basic components of an air heat pump package comprise a heating coil, extractor fan and a heat pump.

The proposed variable refrigerant flow (VRF) system will meet the heating demands of the occupants efficiently, whilst also giving occupants flexible control over their energy consumption. This solution would provide the following benefits:

- Highly energy efficient heating systems are provided that are able to deliver both heating and cooling, dependent upon ambient temperatures and comfort requirements;
- This technology benefits from a low 'carbon footprint' due to the inherent efficiency of the heat pump process. It is a well-established technology with an anticipated long lifespan - with proper care they can be operational for up to twenty years;
- The planned decarbonisation of the UK electricity grid over time will further reduce the operational carbon emissions as a consequence; and,
- There are no fuel storage issues associated with heat pumps.

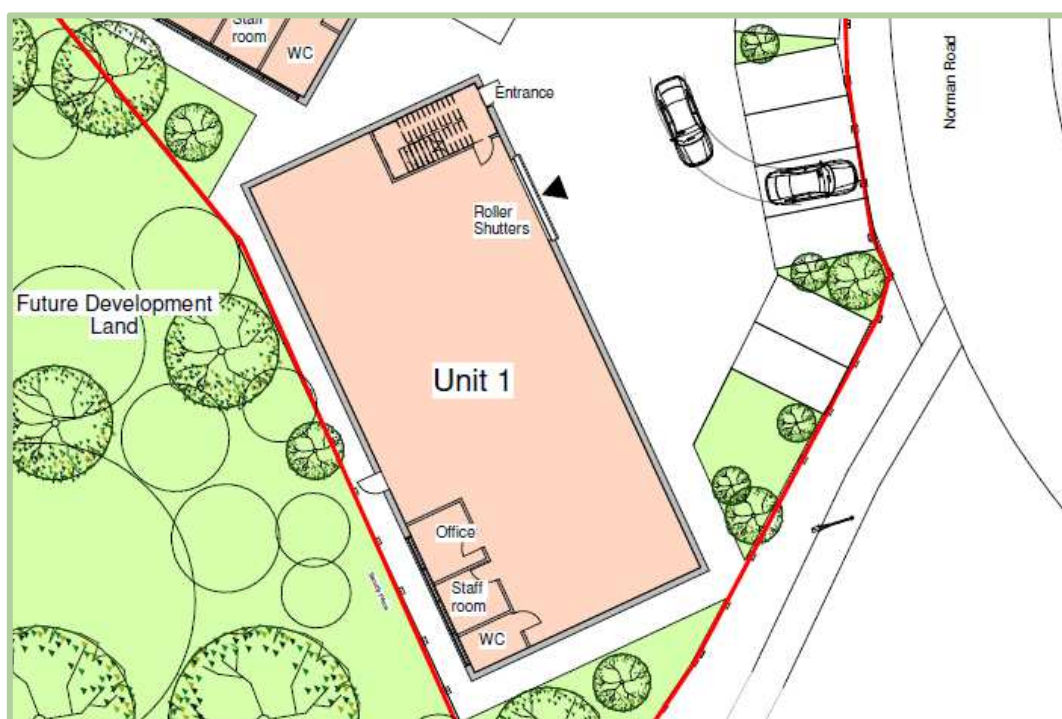


6. ENERGY PERFORMANCE CALCULATIONS

To demonstrate the environmental benefits associated with the 'fabric led' specification and carbon emissions reduction at the site, approved Simplified Building Energy Model (SBEM) software has been used to generate representative energy demand models of the industrial units. The subsequent BRUKL document has been produced to demonstrate compliance with Building Regulation, Part L Approved Document Volume 2 (2021).

Unit one was chosen to be assessed, as it constitutes an average sized unit and provides a robust indication of the overall performance of the development proposals.

Figure 6.1 – Proposed Unit 1 Floor Plan



6.1.1 Energy Performance Emission Calculations

Table 6.1 below presents a summary of the results, which show the building emission rate and energy demand performance associated with the proposed energy strategy for the representative unit.

Table 6.1 – Calculated Regulated Building Emission Rate

Building BER (kgCO ₂ /m ² /yr.)	8.72
Target TER (kgCO ₂ /m ² /yr.)	9.33
Variance (%)	6.54

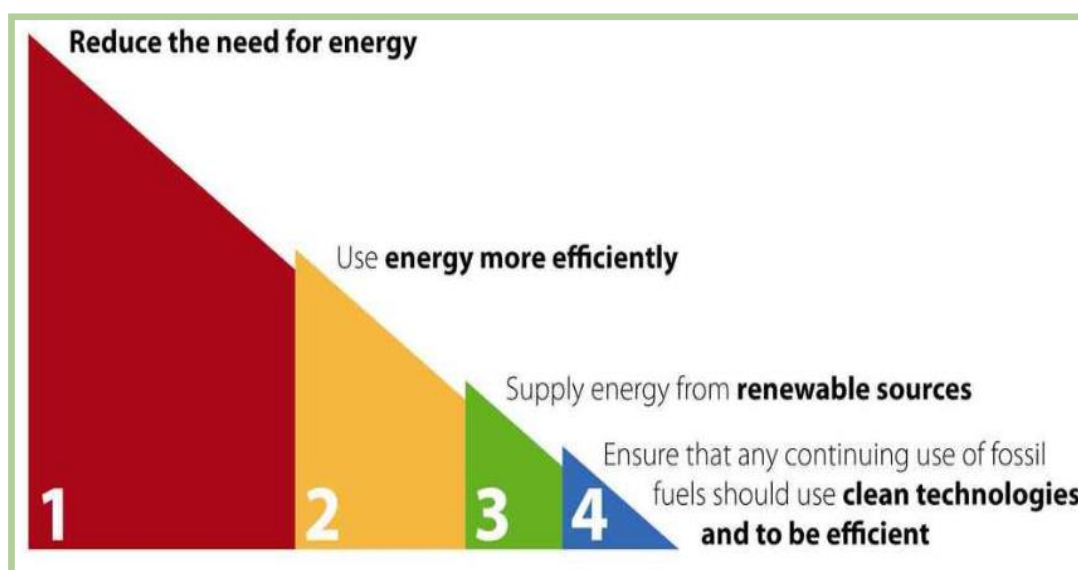


This development will provide a **6.54% improvement above the stringent current Building Regulation, Part L Approved Document Volume 2 (2021) standards.**

6.2 Energy Hierarchy

As reviewed in the previous sections, the proposals will incorporate an enhanced material and mechanical specification along with high quality design and construction standards, in order to improve the energy efficiency of the industrial units. The scheme has been designed in accordance with the 'energy hierarchy' as required by Core Strategy Policy G1 as demonstrated below:

Figure 6.2 – The Energy Hierarchy



The Energy Hierarchy provides a framework to guide energy policy and decision making to achieve practical and cost-effective carbon emission reductions. The hierarchy prioritises such demand-side activities to reduce wastage and improve efficiency.

The construction, design and specification proposed for this scheme will deliver seven industrial units that are inherently efficient and cost-effective during occupation.

First Principle

The buildings will be constructed with a material and design specification which exceeds minimum Building Regulation standards and includes numerous efficiency measures designed to reduce heat losses and minimise energy demand.

This improved fabric approach to minimising energy demand and associated carbon dioxide emissions through the performance of the thermal envelope is aligned with the first principle of the energy hierarchy which states that reduction in energy demand should be achieved initially by energy efficiency.



Second Principle

The proposed 100% low energy LED lighting provision and sophisticated control systems for the space and water heating will boost the operational efficiency of the units. The ventilation systems ensure that energy consumed is managed efficiently, as per the second principle of the Energy Hierarchy.

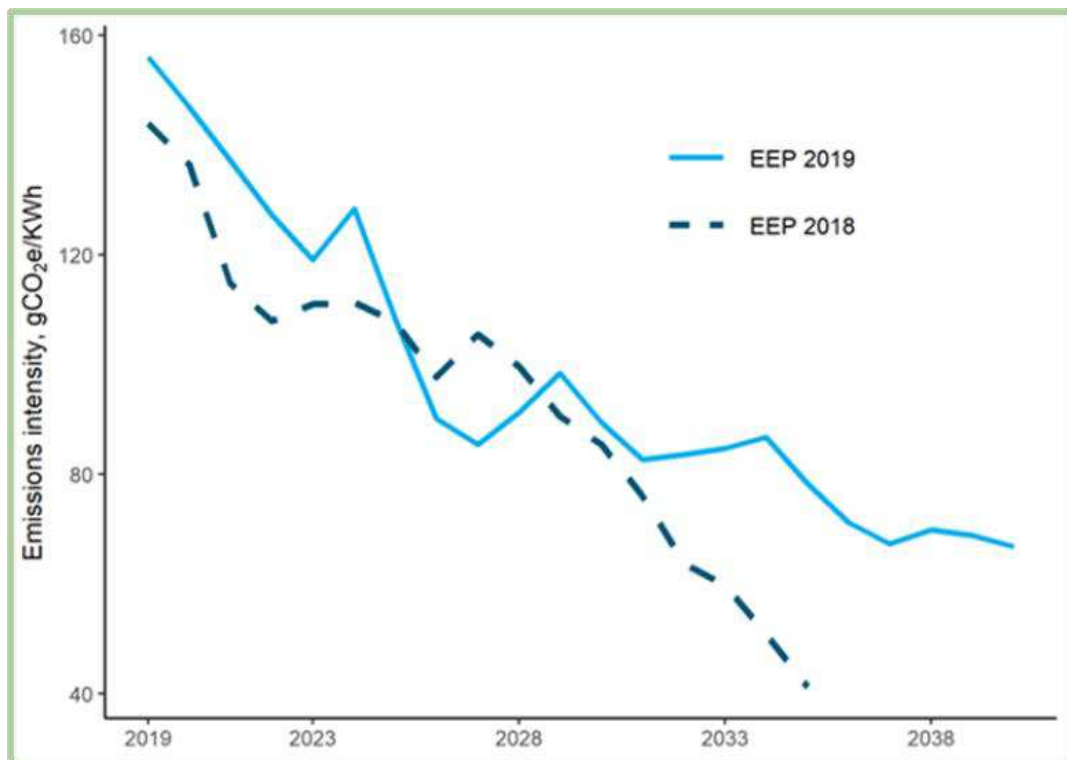
Third Principle

The specified VRF heat pump will provide all space heating demands to the office and staff room areas. Thereby meeting the third principle of the energy hierarchy.

Fourth Principle

Furthermore, as the UK electricity grid's carbon dioxide (CO₂) footprint continues to improve, so too would the emissions associated with the operational phase of the proposed scheme which consumes grid electricity. Figure 6.3 below presents the BEIS Energy and Emissions Projections 2018).

Figure 6.3 - Energy and Emissions Projections 2020 (BEIS)



7. CLIMATE CHANGE EMERGENCY

In July 2019 Rochdale Borough Council declared a climate emergency. In support of this, the developer wishes to highlight the following measures that will form part of the specification of this development:

- An energy strategy that aligns with the Council's planning policies and Part L of the Building Regulations, in relation to carbon emissions and minimising energy consumption:
 - In securing compliance with the current, Building Regulation Part L targets, a commitment is made to construct a high quality, energy efficient thermal envelope thereby minimising demand side energy loads – in accordance with the principles of the Energy Hierarchy.
- Waste is considered to be a misuse of natural resources and also contributes a large proportion of the UK's carbon footprint;
 - A site waste management plan (SWMP) will be produced by the developer to limit the on and off-site environmental impacts of construction in accordance with **Core Strategy Policy G11**; and,
 - During occupation, the building will benefit from recycling facilities to enable the local authority waste reduction targets, diverting more materials away from landfill.
- The building will be designed to incorporate features that will serve to reduce energy demand, and in turn, carbon emissions arising from access to the building:
 - Any external lighting provisions will include active sensors; and,
 - The fit-out specification of the building will seek to minimise water demand. Water efficiency measures (such as dual flush toilets and flow restrictors) will limit potable water demand. This will reduce water heating energy loads and also cut the process energy required to supply clean drinking water.
- The site is located minutes away from several sustainable modes of transport. This is facilitated by:
 - The bus stop on the A6060 Mellor Street, located less than one kilometre from the site; and,
 - The nearest train station is within a seventeen-minute walk from the site.

These commitments, in combination, seek to work towards the carbon reduction target of no more than 1.5°C global temperature increase and assist the council in meeting their Climate Change Emergency objectives.



8. CONCLUSION

This Statement has reviewed the sustainability performance of the proposed Norman Road Development against national and local planning policies. The conclusion that can be drawn from the review is as per the following:

Sustainability Performance –

- Water efficiency measures will be maximised within the building. The internal water strategy will exceed the regulatory standard specified to achieve a calculated daily consumption of <110 litres/person/day through **the specification of efficient water fixtures**.
- The proposed scheme location promotes access **to sustainable transport options**. It has cycle storage and access to regular busses which will contribute towards creating a highly connected and sustainable development. Therefore, meeting the requirements of **Core Strategy Policies C6, G1 and T2**.
- The development site is **located within Flood Risk Zone 1** and **will not increase the risk of flooding** onsite in accordance with **Core Strategy Policy G8**.
- Waste arising during construction will be minimised through the **implementation of a Site Waste Management Plan (SWMP)**. The SWMP will be used to ensure that there is adequate management, and that storage of construction waste takes place in line with the Council's policies. Opportunities for the possible recycling of construction from excavation works will also be considered in line with **Core Strategy Policy G11**.
- **A refuse management strategy** has been developed to manage waste and recyclables from the operational phase of the development. Source segregation and the provision of refuse areas will encourage the individuals to recycle and **divert waste away from landfills**.
- **Responsibly sourced materials with low environmental impact** will be selected and local suppliers will be prioritised where possible. Material selection will be carefully considered to avoid the use of toxic materials and materials with VOCs.
- The development will incorporate **ecological enhancing features** to generate a **net gain on site in accordance with policy G7**. Additionally, It has been determined that the Norman Road development is expected to **achieve a 0.065 uplift in green infrastructure** based upon the Rochdale MBC toolkit analysis.

Energy Strategy –

The development will be designed and specified in accordance with **the principles of the energy hierarchy** and exceeds the **targets and guidance set by Rochdale Borough Council**:

- The focus is on reducing the demand for energy by **limiting heat gains and losses through the building fabric** which includes an enhanced material specification, well beyond the regulatory requirement in accordance with **Core Strategy Policy G2**.
- The scheme will integrate highly efficient mechanical and electrical systems, including a **Variable Refrigerant Flow heat pump for space heating requirements** to the office areas in accordance with **Core Strategy Policy G2**.



- The scheme will also utilise **low energy lighting** and **time and temperature controls** to ensure efficient consumption.

Furthermore, the proposals accord with the aims of the National Planning Policy Framework, as follows:

- The **re-use of the piece of brownfield land in a highly accessible, urban location** will provide a development that inherently supports **sustainable commercial space with access to local amenities and sustainable modes of transport**;
- **Construction practices that minimise adverse impacts on the environment** will be adhered to including a waste management strategy to reduce the quantity of waste generated, and to increase re-use and recycling, a commitment will be made to minimise waste and pollution; and,
- **Improving upon the regulatory Part L compliance criteria** will assist in lessening the impact of this development on the environment by way of reducing carbon emissions.

In conclusion, the proposed development will deliver a highly energy efficient, low carbon scheme, providing a quality development that accords with the guidance provided within Rochdale's Core Strategy as well as national planning and regulatory standards.



BRUKL Output Document**Compliance with England Building Regulations Part L 2021**

Project name

Norman Road Unit 1**As designed**

Date: Thu Mar 02 12:19:11 2023

Administrative information**Building Details**

Address:

Certifier details

Name: Chris Palmer

Telephone number: 01829 733 444

Address: 77 High Street, Tarvin, CH3 8JA

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.0

Interface to calculation engine: DesignBuilder SBEM

Interface to calculation engine version: v7.1.4

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

Foundation area [m²]: 173.05**The CO₂ emission and primary energy rates of the building must not exceed the targets**

Target CO ₂ emission rate (TER), kgCO ₂ /m ² :annum	9.33
Building CO ₂ emission rate (BER), kgCO ₂ /m ² :annum	8.72
Target primary energy rate (TPER), kWh _{ep} /m ² :annum	51.51
Building primary energy rate (BPER), kWh _{ep} /m ² :annum	50.86
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.46	1.64	L00 - Storage_P_7
Floors	0.18	0.14	0.18	L00 - WC_S_3
Pitched roofs	0.16	0.18	0.18	L00 - Storage_R_23
Flat roofs	0.18	-	-	No heat loss flat roofs
Windows** and roof windows	1.6	1.92	2.1	L00 - Storage_G_21
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	1.9	1.9	L00 - Storage_D_11
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-Limit} = Limiting area-weighted average U-values [W/(m ² K)] U _{a-Calc} = Calculated area-weighted average U-values [W/(m ² K)] U _{i-Calc} = Calculated maximum individual element U-values [W/(m ² K)] * 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 ² K 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

