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One North Parade, Manchester

Environmental Standards Statement

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Contents

1.0	Introduction	5
2.0	Project Background	6
2.1	The Site	6
2.2	Proposed Development	6
3.0	Policy Review	6
3.1	National Planning Policy	6
3.2	Manchester City Council Plan 2012-2027	Error! Bookmark not defined.
3.3	Places for Everyone (PfE) Policy	10
3.4	Manchester's Great Outdoors	15
3.5	Climate Emergency	15
3.6	Regulatory Framework	16
3.7	Applicable Criteria	Error! Bookmark not defined.
4.0	Sustainability Statement	18
4.1	Energy Performance and Carbon Dioxide Emissions	18
4.2	Water Management	19
4.2.1	Flood Risk	19
4.2.2	Drainage Strategy	20
4.3	Waste Management	21
4.4	Ecology & Biodiversity	22
4.5	Transport	22
4.6	Health, Wellbeing and Social Value	23
4.7	Manchester City Councils Green and Blue Infrastructure Strategy	23
5.0	Energy and Carbon Strategy	24
5.1	Build Fabric and Thermal Performance	25
5.2	Building Services	26
5.3	Energy Performance Calculations	27
5.4	Energy & Carbon Proforma	28
5.5	Overheating Risk	29
5.6	District Heat Networks	29
6.0	Proposed Renewable Energy Solution	30
7.0	BREEAM	32

7.1	BREEAM.....	32
7.2	Potential BREEAM Rating.....	33
7.3	BREEAM Credit Award Review	34
7.3.1	Management.....	34
7.3.2	Energy	36
7.3.3	Materials	37
7.3.4	Biodiversity.....	39
7.3.5	Pollution.....	40
8.0	Summary.....	41
9.0	Appendix A – Proposed Floor Plans	42
10.0	Appendix B – Climate Change Resilience Risk Assessment (CCRRA)	46
10.1	Introduction.....	46
10.2	Methodology & Assessment Criteria.....	46
10.3	Identification and Evaluation of Risks from Climate Change	50
10.4	Increasing the Resilience of the Proposed Development to Climate Change.....	53
10.5	Conclusion	53

1.0 Introduction

Crookes Walker Consulting Limited (CWC) have been commissioned to review the sustainability and energy performance for the One North Parade proposed development, located in Manchester city centre.

The purpose of this statement is to outline the relevant policy context and requirements set by Manchester City Council and to show how the developer has addressed these objectives in their proposals, ensuring all feasible steps have been taken to achieve a sustainable development on this site.

The design features, specifications, and characteristics of the project are evaluated to demonstrate how the proposals contribute to sustainability in Manchester while minimising environmental impacts. This serves as a sustainability assessment to support the planning application.

This report is intended to support the planning application and establish an approach for delivering the development in line with the Council's criteria, which the developer is committed to implementing.

2.0 Project Background

2.1 The Site

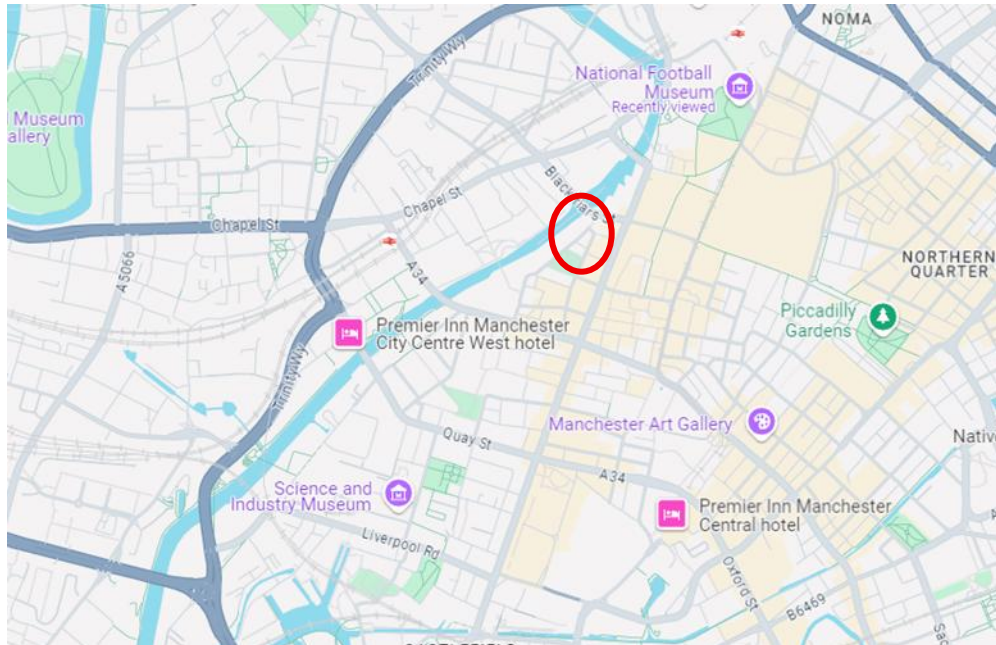


Figure 1. Site Location

The site is in Manchester city centre. The properties are currently office buildings. It is situated near Deansgate and is within a short distance of Spinningfields and the city centre. The offices are just a few minutes' walk from Victoria railway and Metrolink stations, with various on-street and off-street parking options available nearby.

2.2 Proposed Development

The proposed development involves the demolition of the existing office buildings and the construction of a new-build office, including a restaurant on the ground and mezzanine floors. The proposed floor plans are presented in Appendix A.

3.0 Policy Review

3.1 National Planning Policy

The 2024 National Planning Policy Framework (NPPF) reaffirms that the planning system should actively steer development toward sustainable outcomes. At its core remains the presumption in favour of sustainable development, serving as the guiding principle across plan-making and decision-taking processes. Sustainable

development, as defined in the updated NPPF, integrates three interdependent objectives:

An economic role – 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.

A social role – 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 well-designed, beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and

An environmental role – to protect and enhance our natural, built and historic environment, including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.

These elements are interdependent with the NPPF, defining sustainable development. The NPPF states that the planning system's purpose is to support sustainable development, meaning meeting today's needs without limiting future generations. It also highlights that UN members, including the UK, have agreed to work toward the 17 Sustainable Development Goals (SDGs) by 2030, which cover social, economic, and environmental goals.

3.2 Core Strategy

Manchester Core Strategy (CS) – originally adopted on 11 July 2012 (LDF Core Strategy DPD); superseded in part by the Addendum to Manchester Core Strategy (2024), which must be read alongside the original document.

Key Core Strategy Requirements

CS Policy DM 1 - Development Management requires all development to have regard to a number of development principles. Subject to scheme viability, developers may be required to demonstrate that new nondomestic development to achieve a BREEAM Rating of 'Very Good' or for domestic development to achieve the Code for Sustainable Homes standard.

CS Policy EN 4 - Reducing CO₂ Emissions by Enabling Low and Zero Carbon Development requires all development to follow the principle of the Energy Hierarchy, being designed:

- To reduce the need for energy through design features that provide passive heating, natural lighting, and cooling.
- To reduce the need for energy through energy efficient features such as improved insulation and glazing.
- To meet residual energy requirements using low or zero carbon energy generating technologies.

CS Policy EN 5 - Strategic Areas for low and zero carbon decentralised energy infrastructure include:

- District Centres and associated major development sites.
- Airport Strategic Site.
- Strategic housing location; and,
- Strategic employment locations. Within these areas, new development, regeneration and retrofit projects will be expected to take place in the context of more detailed proposals for decentralised low and zero carbon energy infrastructure in the form of energy proposals plans.

CS Policy EN 6 - Target Framework for CO₂ Reductions from Low or Zero Carbon Energy Supplies requires applications for residential development of 10 or more units and all other development over 1,000m² to meet, as a minimum, the targets shown in the tables below, unless unviable.

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 +10%increase on Part L 2010 (Applies to commercial uses with a high proportion of emissions from electricity use (>45 kg CO ₂ /m ²))	+10% increase on Part L 2010
Target 3: Micro generation area	+15% increase on Part L 2010

The Proposed Development falls under the Target 2 criteria and must comply with Part L (2021). The emission reductions targeted within policy EN6 relate to Building Regulation Part L 2010. Because of the reduction in emission rates required by current building regulations (Part L, 2021) relative to Part L 2010, the revised equivalent target CO₂ emission reductions for the residential scheme are presented below:

- Non-domestic – 6% building emission rate reduction over Part L 2013.

Please note that the Proposed Development will be compliance checked against the Part L (2021) Building Regulations. By virtue of complying with these emerging regulations, the scheme commits to reduce building carbon emissions by at least 27% in relation to Building Regulations Part L (2013) standards.

CS Policy EN 8 – Adaption to Climate Change requires all new development 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 rainwater permeability.
- Reduction in urban heat island effect using Green Infrastructure such as green roofs, green walls, increased tree cover and waterways.
- The need to control overheating of buildings through passive design; and
- The opportunity to provide linked and diverse green space to enhance natural habitats which will assist species adaptation.

CS Policy T 1 – Sustainable Transport aims 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 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); and
- Facilitate modes of transport that reduce carbon emissions e.g., by incorporating charging points for electric vehicles, subject to their appropriate design and location.

3.3 Places for Everyone (PfE) Policy

The 'Places for Everyone' (PfE) Plan is a long-term plan, adopted in March 2024, of nine Greater Manchester districts (Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan) for jobs, new homes, and sustainable growth.

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

PfE was adopted in March 2024, now part of the statutory development plan, PfE replaces or partially supersedes several Core Strategy policies, as detailed in the CS Addendum and PfE's Appendix 5, including but not limited to: SP1, EC1, H1, H2, EN3, EN4, ENE 6 and EN17 (covering heritage, energy, housing, climate adaptation, and environmental quality).

In addition to the policies that replace or partially supersede Core Strategy policies, there are several other PfE policies of direct relevance to this Statement and to the consideration of planning applications:

- JP-SP3: Heat and Energy Networks – supports the development and expansion of heat and energy networks to deliver low carbon and affordable energy solutions.
- JP-SP6: Resource Efficiency – promotes efficient use of materials, minimisation of waste, and circular economy approaches within new developments.
- JP-S4: Flood Risk and the Water Environment – ensures that development avoids, manages, and mitigates flood risk while protecting and enhancing water quality and resources.
- JP-G8: Net Enhancement of Biodiversity and Geodiversity – requires development to deliver measurable biodiversity net gain and protect valuable habitats and landscapes.
- JP-P1: Sustainable Places – establishes principles for creating healthy, inclusive, and sustainable communities.
- JP-C8: Transport – promotes sustainable travel choices, active transport infrastructure, and integration with public transport networks.

Taken together, these policies form a comprehensive planning framework for ensuring that new development in Greater Manchester is low carbon, climate resilient, resource efficient, and environmentally and socially sustainable.

The table below shows the PfE Policies that have partially replaces the MCC policies.

MCC Policy	PfE Policy	Description
CS Policy EN4 - Reducing CO ₂ Emissions by Enabling Low and Zero Carbon	Policy JP-S2 – Carbon and Energy	All new developments must be net-zero carbon by 2028 and must adhere to robust energy hierarchy. It also emphasises retrofitting existing buildings, renewable and low-carbon energy networks, electric vehicle charging, and nature-based solutions
CS Policy EN6 - Target Framework for CO ₂ Reductions from Low or Zero Carbon Energy Supplies	Policy JP-S2 – Carbon and Energy	
	Policy JP-S 3 Heat and Energy Networks The provision of decentralised energy infrastructure is critical to the delivery of our objectives for low carbon growth, carbon reductions and an increase in local energy generation. The following measures will help to achieve this: 1. Delivery of renewable and low carbon energy schemes will be supported with particular emphasis on the use of decentralised energy networks in areas identified as "Heat and Energy Network Opportunity Areas". These will be identified where: a. Existing heat/energy networks are operational or have been commissioned; b. Proposals for new heat	

	networks/energy networks are being progressed, or future opportunities have been identified in city-region master planning; c. Sufficient density of existing heat demand occurs(40); and d. Significant future development is proposed at the strategic development locations. 2. Within the identified "Heat and Energy Network Opportunity Areas", there will be: a. A requirement that new residential developments that are '10 dwellings or more' or other developments over 1,000m² floorspace should evaluate the viability of: Connecting to an existing or planned heat/energy network (where such a network has been identified within the Heat Network Opportunity Areas); and/or i. ii. Installing a site-wide or communal heat/energy network solution. b. A requirement, where unviable to connect to an existing network or install a site-wide or communal heat/energy network, for new development to incorporate appropriate	
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	capability to enable future connection (e.g. adequate space in plant-room for plate heat exchangers, capped-off flow/return connections); c. A 'presumption in favour(41) of network connection' where new residential developments over 10 dwellings and other developments over 1,000 sq m floorspace are within 500m of an existing heat network, or where a network is being delivered; d. An expectation that new industrial development will demonstrate that opportunities for using waste heat locally have been fully examined and included in proposals unless proven to not be viable. An expectation that where publicly owned buildings and assets adjoin new major development sites, opportunities for these buildings and assets to connect to site-wide proposals will be considered, and f. An expectation that any site-wide networks will be designed to enable future expansion to adjoining buildings or assets as appropriate. 3. In support of the above, all	
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	decentralised heat/energy network viability assessments are required to demonstrate consideration and analysis of: a. Identification of existing and proposed heat/energy loads; b. Identification of heat/energy supply sources; c. Identification of opportunities to utilise renewable and low carbon energy sources; d. Identification of opportunities to utilise waste and secondary heat sources; e. Impact of proposals and technology choices on local air quality; f. Design according to national best practice in relation to efficient heat network design (e.g. CIBSE CP1 Heat Networks: Code of Practice for the UK(42), or equivalent); and g. Adopting appropriate consumer protection standards (e.g. HeatTrust(43), or equivalent).	
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To support delivery of these policies, the Design Guidance for Net Zero (2025) sets out detailed design principles, such as optimising building orientation, insulation, ventilation, and material choices to ensure developments can realistically achieve net zero performance. The Low Carbon Heat guidance focuses on how to deliver heating systems that are not only low carbon but also cost effective and affordable for residents, covering options such as heat pumps, district heat networks, and hybrid solutions. The Submission Guidance explains the evidence applicants must

submit with planning applications, including energy statements, carbon assessments, and justification reports, to demonstrate how proposals meet the requirements of PfE policies JP-S2 and JP-S3.

3.4 Manchester's Great Outdoors

Manchester's Green and Blue Infrastructure Strategy focuses on enhancing the city's green and blue infrastructure over the coming decade, targeting completion by 2025. To achieve this vision, four key objectives have been established:

1. Improve the quality and function of existing green and blue Infrastructure such as, gardens.
2. Incorporate suitable green and blue infrastructure as an essential element of new developments to contribute to the city's growth.
3. Improve access and connectivity to green and blue infrastructure both within the city and in surrounding areas.
4. Increase and encourage a broader understanding and awareness of the advantages that green and blue infrastructure offers to residents.

3.5 Climate Emergency

On 10th July 2019, a climate emergency was declared. The motion recognizes climate change as a significant threat to Manchester's future and affirms MCC's dedication to integrating this issue into the council's decision-making process. It ensures that all major decisions are made with the city's goal of achieving zero-carbon status by 2038 in mind. The actions are organised into five main sections as outlined below:

- Buildings and energy.
- Transport and travel.
- Reducing consumption emissions and influencing Suppliers.
- Climate adaptation, carbon storage and sequestration.
- Influencing behaviour and change.

In March 2020, the Executive approved the Manchester Climate Change Framework 2020-2025, a five-year plan detailing actions MCC will implement to reduce carbon emissions from its buildings, energy use, and transport by 50% between 2020 and 2025, aligning with a 13% annual reduction goal. The plan focuses on improving building energy efficiency through retrofits, increasing electric vehicle adoption, and committing to 100% renewable energy sources.

While not officially integrated into planning policy, it remains an important consideration in assessing future development projects.

In consideration of the Climate Emergency a 'Climate Change Resilience Risk Assessment' (CCRRA) has been undertaken and included within Appendix 10 of this report.

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 L, Volume 2 addresses the conservation of fuel and power in new non-domestic buildings. The proposed development will be registered against Building Regulations, Part L2A (2021) which requires all newly constructed buildings to comply with the 5 criteria set out in Approved Document L, Volume 2:

1. Achievement of an acceptable Building CO₂ Emission Rate. i.e., the BER is less than the TER (target emission rate for a notional building).
2. Limits on design flexibility – including U-values, air permeability, air handling plant efficiency, duct leakage, insulation, lighting system efficiency.
3. Limiting solar gains in summer.
4. Construction quality and commissioning - The BER must be recalculated as constructed; and
5. Provision of information - Information must be provided to the building operator.

3.7 Policies

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:

- CS Policy DM 1 - Development Management.
- CS Policy EN 4 – Reducing CO₂ Emissions; Following the principles of the Energy Hierarchy to reducing CO₂ Emissions.
- CS Policy EN 5 - Strategic Areas for low and zero carbon decentralised energy infrastructure.
- CS Policy EN 6 – Target Framework for CO₂ Reductions from Low or Zero Carbon Energy Supplies.
- CS Policy EN 8 – Adaption to Climate Change.

- CS Policy T 1 – Sustainable Transport.
- 'PfE' Policy JP-S2 – Carbon and Energy.
- 'PfE' Policy JP-S3 – Heat and Energy Networks.
- 'PfE' Policy JP-S6 – Resource Efficiency
- The Guide to Development in Manchester SPD.
- A Green and Blue Infrastructure Strategy for Manchester.
- Approved Document L (2021) will guide the compliance standards for energy demand and carbon dioxide emissions from buildings to ensure compliance with CS Policy EN 6
- Design Guidance for Net Zero

4.0 Sustainability Statement

This section evaluates the proposals, outlining the specific approach, design elements, and specifications that will help minimise the developments environmental impact. It aligns with the sustainable design brief and adheres to current council policies, covering the categories listed in the Guide to Development in Manchester, Supplementary Planning Document (SPD). Information reporting on these topics is available upon request.

- Energy efficiency.
- Renewable energy.
- Environmental design.
- Water management and weather resilience.
- Waste management.
- Construction management.
- Biodiversity; and,
- Waterways.

The key specifications, site characteristics and design measures of the proposed development are considered below. They will mitigate the environmental impact of the scheme throughout both the construction stage and the future occupation of the development.

4.1 Energy Performance and Carbon Dioxide Emissions

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

The energy strategy focuses on a holistic and multi-faceted approach of improving the buildings' performance by applying a fabric led approach and through improvements in the efficiency of the 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 fabric.
- Low air permeability.
- Solar control glazing to mitigate overheating risk.
- Air Source Heat Pumps.
- Heat recovery ventilation systems (MVHR).
- Optimising onsite energy generation via photovoltaic panels.

4.2 Water Management

4.2.1 Flood Risk

A flood risk assessment has been prepared by Renaissance. The site lies within Flood Zone 1, where the likelihood of flooding is low, including risks from pluvial, surface water, sewer, and reservoir sources. While it is considered to have a moderate risk of groundwater flooding, overall, the site is regarded as appropriate under Planning Practice Guidance and complies with the flood risk policies set out in the Statutory Development Plan.

Figure 1 shows the site falls completely within Flood Zone 1; land assessed as having a less than 1 in 1,000 annual probabilities of river or sea flooding (<0.1%). The risk of flooding from rivers and sea is therefore very low.

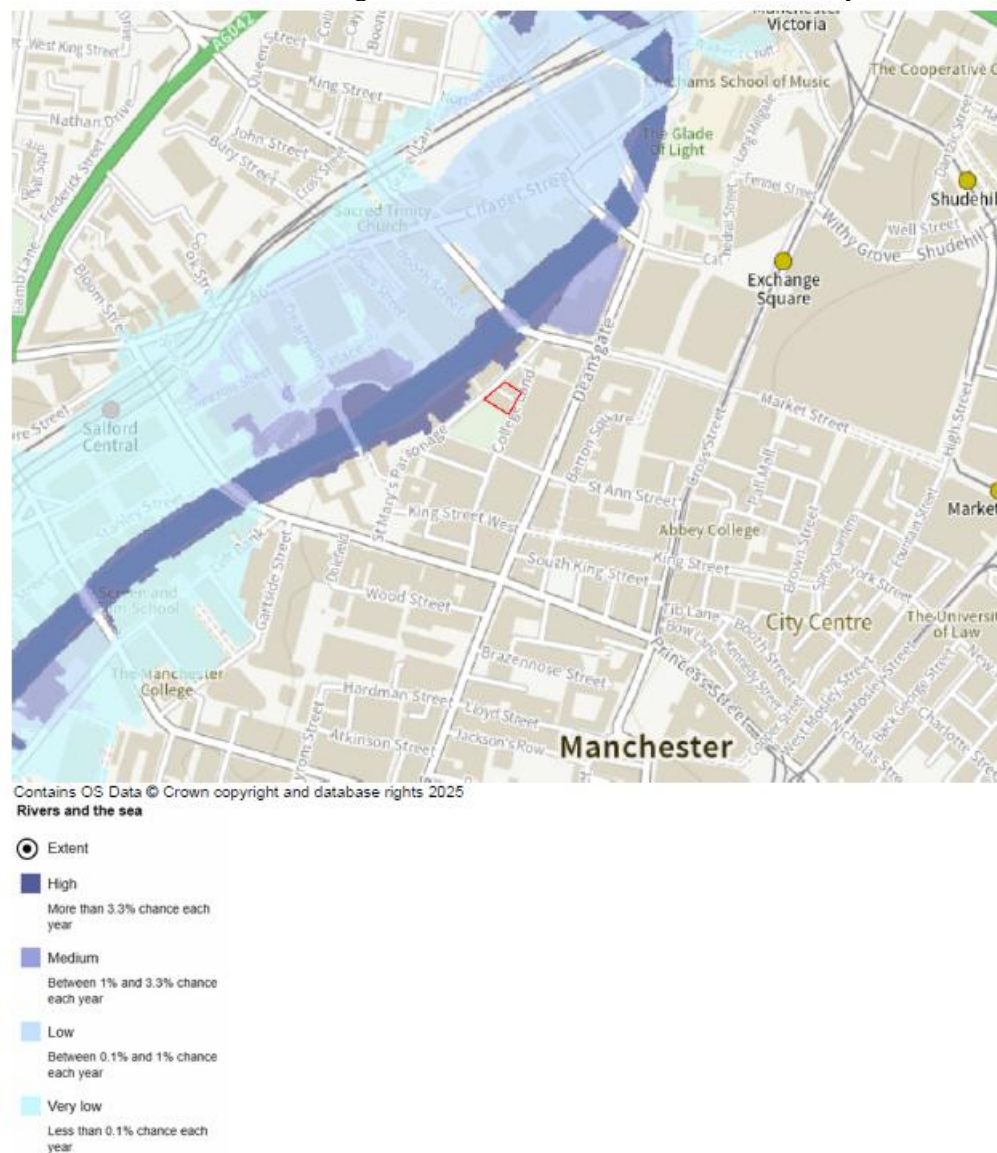


Figure 2. Risk of Flooding from Rivers & Seas

The EA Map showing risk of flooding from surface water is presented in Figure 3. This type of flooding can be difficult to predict, much more so than river or sea flooding as it is difficult to forecast exactly where or how much rain will fall in any storm. In addition, local features can greatly affect the chance and severity of flooding. The site is at a low (between 0.1% and 1%) risk of surface water flooding

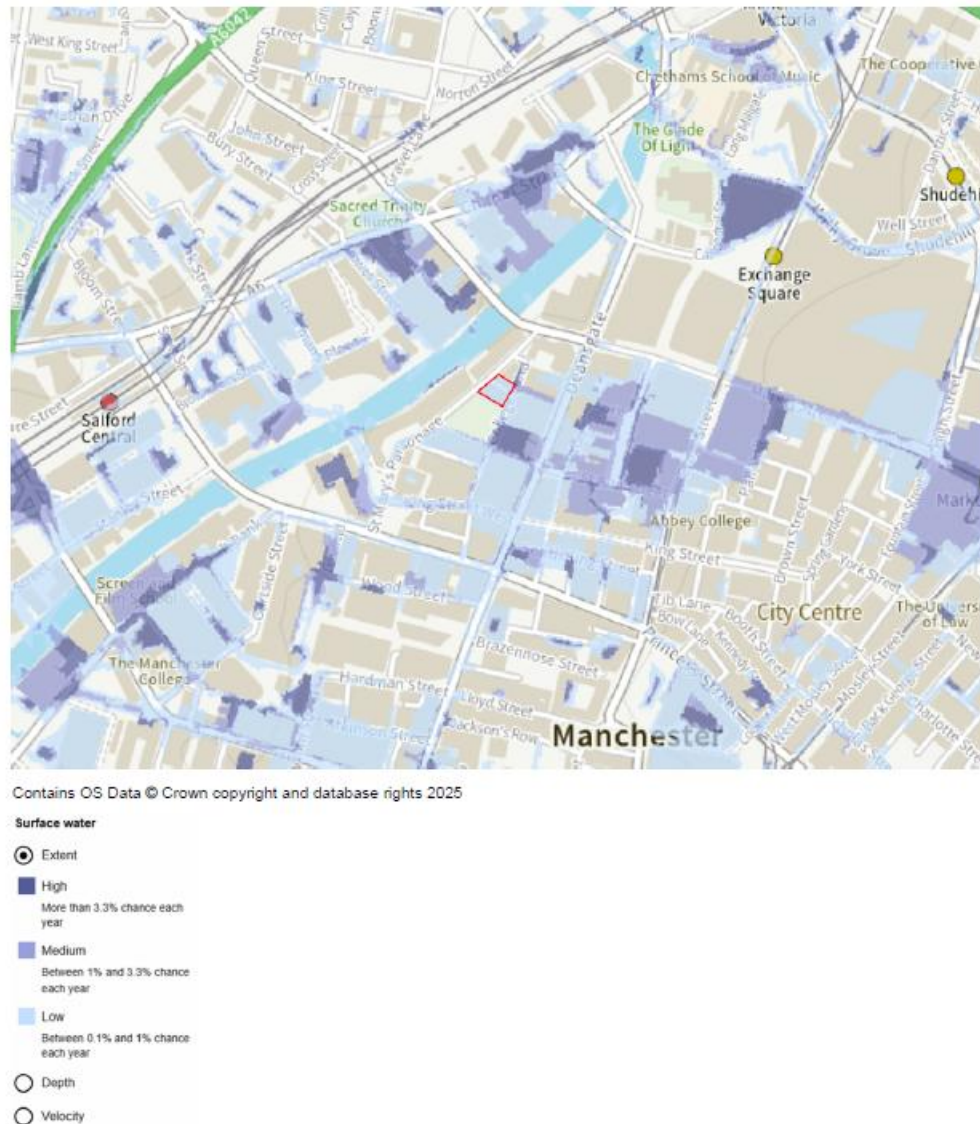


Figure 3. Risk of Flooding from Surface Water

4.2.2 Drainage Strategy

To minimise the risk and impact of localised flooding, watercourse pollution, and other environmental concerns both on and off-site, a site-specific Drainage Strategy has been prepared by Renaissance.

The development is to have a dedicated surface water network that collects the run-off from the proposed building roof and external landscaping and discharges to the combined public sewer within Parsonage via an existing connection. The suitability of re-using an existing connection is to be validated through a survey of the existing private drainage network at the next stage. The discharge from the site to the public sewer is to be limited to greenfield run-off rates where possible. Given the small site area, rates should be restricted to 2 l/s so to not increase the overall flood risk to the development. The surface water network should use a vortex flow control to restrict flow.

Surface water attenuation is to be provided by utilising a blue roof and attenuation tank under the basement of the proposed building.

The surface water drainage network is to be designed in accordance with Building Regulation Part H, BS EN 752, Code for Adoption and the recommendations set out within the Circa SuDS Manual. In addition, the following requirements will also be adopted in accordance with the Non-Statutory Technical Standards for Sustainable Drainage: Practice Guidance:

- The below ground drainage system will be designed to ensure flooding does not occur on site for the 1 in 30 year and no flooding to habitable spaces for the 1 in 100-year + climate change storm events
- The surface water system is to be designed to accommodate the 1-, 2-, 30- and 100-year return events with 40% and 45% climate change allowances for the 30- and 100-year events respectively. The climate change allowances should be reviewed at the detailed design stage of each plot to ensure the latest allowances are used.

The foul water drainage from the building will be collected by a dedicated gravity foul network. The system is to discharge via an existing connection into the existing public combined sewer within Parsonage. The suitability of re-using an existing connection is to be validated through a survey of the existing private drainage network.

4.3 Waste Management

A Waste Management Strategy (WMS) has been prepared by Curtins to consider the potential refuse and recyclable waste volumes, including potential organic waste, and for all uses of the proposed development.

The waste forecast has been calculated based on the recommendations set by Manchester City Council's Waste Storage and Collection Guidance for New Developments (GD04), Version 7.00 (and further supported by the estimations set on the Code of Practice BS 5906:2005).

Both the office and restaurant use will be served by private refuse collections. The bins will be transported to the collection point by the management company. The temporary collection point is located on Southgate outside of Arkwright House, with the permanent collection point located along College Land.

All uses are anticipated to be served by collections at a frequency of at least three times a week for both the office and restaurant uses. The collection frequency is subject to be updated following occupation, as typically the waste generated by both the office and restaurant uses varies significantly based on the final occupier.

The proposals include a waste storage room for the office uses at the basement level. The size of the bin store has been determined accordingly, whilst consideration to segregation and recycling has been given. Whereas waste generated by the restaurant would be stored internally within its own premises.

The proposed development will be delivered in accordance with Paragraph 115 of the NPPF, as it would not have an unacceptable impact on highway safety, nor would there be a significant or severe residual cumulative impact on the surrounding highway network.

4.4 Ecology & Biodiversity

Penny Anderson Ecologists have done a preliminary roost assessment for bats and nesting birds. As there were no vegetated habitat parcels within the development boundary, no habitat mapping exercise was completed. Based on this, it is also recommended the development can be scoped out of statutory Biodiversity Net Gain (BNG), meeting the de minimis exemption of impacting less than 25 square meters of vegetated habitat (UKGov 2024). 3.44 No plants listed as invasive non-native species (INNS) in Schedule 9 of the WCA (1981, as amended) were recorded within the site boundary.

4.5 Transport

The development is car free therefore there will be no car parking provided, and the development will include a cycle store delivering storage in the form of bike racks and accompanying facilities such as showers and lockers in the basement level.

A review of baseline conditions and highway safety in the vicinity of the site has been undertaken. It is not considered that there is an existing highway safety issue that is likely to be exacerbated by the proposed development.

The site is highly accessible by sustainable modes of transport. The surrounding area exhibits good levels of pedestrian and cycling infrastructure, and there are several public transport opportunities within acceptable walking distance of the site.

Trip generation forecasts using TRICS data have demonstrated that there would be a potential increase in vehicular trip generation at the site comparing the existing and proposed uses during AM and PM peak hours. The actual trip generation at the site is likely to be less than forecast, due to the car-free nature of the proposed development. It is most likely that future staff and visitors would take advantage of the proximity to public transport links and amenities.

A review of relevant local and national transport planning guidance has been undertaken. It is considered that the proposed development conforms with such policy.

4.6 Health, Wellbeing and Social Value

To enable the occupants of the proposed development to lead lower impact lifestyles and enhance their quality of life, the following measures will be incorporated:

- Good levels of natural daylight, enhancing occupants' quality of life and reducing the energy needed for artificial lighting.
- Use of nearby green spaces (Parsonage Gardens) will reduce stress related brain chemicals and positively impact blood pressure. It's also linked to improved performance on tasks that require focus, both during and after time spent in nature.

4.7 Manchester City Councils Green and Blue Infrastructure Strategy

The River Irwell runs close to the development site providing an attractive setting for external areas and associated amenities. This will provide an opportunity to encourage access to part of the city centre's Blue Infrastructure. Parsonage Gardens located opposite the One North Parade development encourages the green infrastructure and ecology of the city.

5.0 Energy and Carbon Strategy

The Energy Strategy for the One North Parade development takes a comprehensive approach to enhancing building performance, emphasising a fabric-first method to reduce energy demand. This is supported by upgrades to mechanical and electrical system efficiency and the integration of renewable and low-carbon energy technologies. The design measures in the strategy meet the policy standards set by Manchester City Council's Core Strategy, and the more recent Places for Everyone and Net Zero Guidance.

In support of the climate emergency, the developer wishes to highlight the following measures that will form part of the specification of this development:

An energy strategy that delivers the current Core Strategy carbon dioxide emission reduction and renewable energy generation targets.

- In securing compliance with the current, stringent 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.
- A commitment is made to achieving at least 6% building emission rate reduction relative to the current Part L (2021) compliance standard.
- The electric space heating strategy will improve upon Manchester's emerging emissions targets.
- Electric Panel Heaters will be utilised in the circulation and WC areas, delivering high efficiency heating.
- The low carbon share of electricity generation is projected to rise from 22% in 2010 to 65% in 2020. As the UK electricity grid CO₂ footprint continues to reduce (see Figure 2 below sourced from BEIS Energy and Emissions Projections 2018), so too will the carbon emissions associated with this scheme.

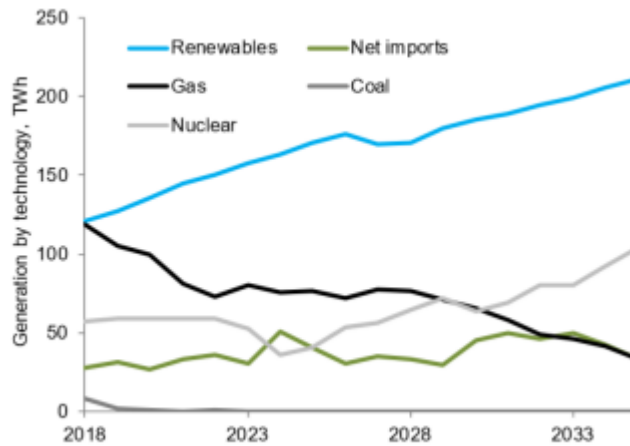


Figure 2. Energy and Emissions Projections 2018 (BEIS)

Furthermore, 'electric' strategies supply electric on demand, are 100% efficient and only use what is required. Therefore, this reduces the overheating of the buildings; and, Electric Panel Heaters will be utilised in the amenity and common areas, delivering high efficiency heating.

5.1 Build Fabric and Thermal Performance

In buildings, heat typically travels through the following construction elements and means:

- Ground Floor.
- External Walls.
- Roofs.
- Doors and Windows.
- Thermal (cold) Bridging; and,
- Uncontrolled Ventilation.

	Fabric Parameters (W/m ² K)
External Wall	0.12
Glazing	1.2 0.4 g value
Roof	0.1
Exposed Floor	0.1
External Door	1.2
Air permeability	5m ³ / (h.m ²) @50Pa

These specifications and design attributes of the scheme will provide the following benefits:

High performance thermal insulation throughout the building envelope (ensuring 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 windows will be specified with argon gas fill and low emissivity coatings to limit heat loss through the panes. The glazing g-value will be specified to optimise beneficial solar gains but limit the propensity for the building to overheat.

Low air permeability of $5\text{m}^3/\text{hm}^2$ (@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 development.

This specification will help to deliver an energy efficient development that achieves an emission rate reduction and fabric energy efficiency performance significantly beyond the requirements set by Building Regulations Part L (2021).

5.2 Building Services

The proposed mechanical and electrical specification that will be incorporated to ensure efficient servicing of the development is presented in the table below.

Zone	Parameter	Value
Offices	System	VRF via ASHP
	System Performance	CoP: 4.0 EER: 5.0 SEER: 6.0

Zone	Parameter	Value
	Ventilation	MVHR SFP: 1.1 W/l/s
WCs	System	Electric Panel Heater
	System Efficiency	100%
	Ventilation	Mechanical
Circulation	System	Electric Panel Heater
	System Efficiency	100%
	Ventilation	Natural
All	DHW	Central Heat Pump
	System Efficiency	4
	System Volume	100
	Storage Losses	0.0063

5.3 Energy Performance Calculations

In order to demonstrate the environmental benefits associated with the energy strategy for the commercial development, a Part L calculation has been completed using the IES Virtual Environment software. It should be noted that these results are indicative of the overall demand for energy.

The table below summarises the calculations, highlighting the regulated energy demand and emission reductions achieved through improved fabric specifications and energy-efficient systems in the development.

Target Emission Rate kgCO ₂ /m ² /year	Building Emission Rate kgCO ₂ /m ² /year	Target Primary Energy Rate kWh/m ² /year	Building Primary Energy Rate kWh/m ² /year	% Emission Rate Improvement over Part L Volume 2 2021	Projected EPC Rating
3.30	2.80	36.01	30.69	14.7	A (8)

5.4 Energy & Carbon Proforma

The figure below shows the Energy and Carbon Proforma for the Development.

		Target values	Building 1	Building 2	Building 3	Building 4	Building 5
Minimise energy demand	Space heating demand (kWh/m ² GIA/yr)	≤ 15	7.07				
	Space cooling demand (kWh/m ² GIA/yr)	≤ 15	7.74				
	Calculation methodology used to calculate space heating demand and confirmation that this covers all homes/blocks	Predictive energy model	TM54 Modelling				
	Form factor per building	≤ 2	0.86				
	Average external wall U-value (W/m ² K)	≤ 0.15	0.17				
	Average window U-value (W/m ² K)	≤ 1 (triple)	1.4				
	Air permeability rate (m ³ /h/m ² @ 50 Pa)	≤ 1	3				
Maximise energy efficiency	BREEAM Ene 01 rating	Excellent	TBC				
	Energy use intensity (kWh/m ² GIA/yr)	-	20.88				
	Calculation methodology used to calculate energy use intensity and confirmation that this covers all homes/blocks	Predictive energy model	NCMPart L Modelling				
Use renewable energy	PV footprint area (% of ground floor space)	-	N/A				
	Annual renewable energy generation (kWh/m ² building footprint/yr)	-	0				
	Renewable energy balance (%)	-	0				
	Total energy used (kWh/yr)	-	0				
	Total energy generated on-site (kWh/yr)	-	0				
Use low carbon energy	Fossil fuel free (yes/no)	Yes	Yes				
	Heat source	Electric	Electric				
	Low Carbon Heat Appraisal completed	Yes	Yes				
	Heat network suitability	-	No				
	Exemption requested	-	No				
	Efficiency of heating system (SCOP)	≥ 3.5	4.5				
	Carbon content of heat (gCO ₂ /kWh)	≤ 100	< 100				
Reduce overheating risk	Has CIBSE TM52 been used to calculate overheating and does the building pass?	Yes	Yes				
	What percentage of spaces are cooled? (% of GIA)	-	76.76				
	Has a CIBSE TM52 assessment been carried out using DSY2 and DSY3 weather files? Have any additional passive measures been included as a result?	Yes	No				
Minimise embodied carbon	Upfront embodied carbon (kgCO ₂ e/m ² GIA)	-	787				
	List top three materials with the highest upfront embodied carbon emissions (kgCO ₂ e/m ² GIA): Material 1	-	er Floor Concrete				
	Material 2	-	prete Foundations				
	Material 3	-	Structural Steel				
	Lifecycle embodied carbon (kgCO ₂ e/m ² GIA) - for large major developments only	-	824				
Offsets	Offset contribution (£)	-					

5.5 Overheating Risk

Passive design measures, such as enhanced fabric performance and efficient glazing, have been incorporated into the development to help reduce solar gains and manage internal heat loads. The building will be comfort cooled, which will mitigate overheating risk and ensure suitable indoor conditions for occupants across office and hospitality areas. Due to the deep floor plans, Manchester city centre location, and the requirement to achieve adequate indoor air quality through filtered supply air, the use of natural ventilation has been discounted.

Approximately 76.76% of the building's occupied spaces are mechanically cooled, ensuring compliance with BREEAM Hea 04 thermal comfort criteria under both current and future climate scenarios.

5.6 District Heat Networks

The One North Parade development has considered the potential for connection to Manchester City Centre's Civic Quarter Heat Network (district heat network); however, it has been deemed not financially viable at this time, with no future connection and is not required to achieve the high-end sustainability credentials currently being targeted.

6.0 Proposed Renewable Energy Solution

A review of the most suitable renewable energy options has been conducted to ensure compliance with Building Regulations Part L (2021).

Low or Zero Carbon Technology	Likelihood of Being Feasible	Main Reason for Dismissal	Feasible to Export Energy?	Cost for Carbon Emission Reduction	Typical Payback
Hydropower	Unfeasible	There is not a running watercourse nearby.	Yes	High	N/A
Combined Heat & Power	Unlikely	Unlikely to be sufficient base load to allow the technology to operate effectively.	No	Medium	N/A
Ground Source Heat Pumps	Unlikely	GSHP pipework not readily available.	No – there is no existing network	Medium	12 Years
Air/Water Source Heat Pumps	Likely	This technology is likely to be applicable.	No – there is no existing network	Low	8-10 Years
Wind Power	Unlikely	Wind power equipment may cause noise problems.	Yes, if the technology is feasible for the development	High	N/A
Biomass	Unlikely	Not an adequately consistent heat load.	No, there is no existing network to be utilised	High	N/A

Low or Zero Carbon Technology	Likelihood of Being Feasible	Main Reason for Dismissal	Feasible to Export Energy?	Cost for Carbon Emission Reduction	Typical Payback
Solar PV	Unlikely	There is no space for Solar PV	Yes, can be easily linked to the grid supplied electricity	Medium	N/A

The proposed LZC technologies for One North Parade are air source heat pumps. This will provide highly efficient heating. The benefits include reduced carbon emissions, lower running costs, and improved energy performance, supporting both sustainability goals and long-term operational savings.

7.0 BREEAM

7.1 BREEAM

BREEAM (Building Research Establishment's Environmental Assessment Method) is globally recognised as the foremost environmental assessment standard for buildings.

The BREEAM UK New Construction scheme offers a performance-focused assessment and certification approach specifically for new non-residential buildings. Its main goal is to reduce the environmental impact of new buildings throughout their lifecycle in a robust, cost-effective way. This is accomplished by encouraging clients and project teams to apply the scheme during critical stages of the design and construction phases.

The building's performance is assessed under a number of categories, including:

- Energy
- Water
- Transport
- Materials
- Land use
- Pollution
- Health and wellbeing
- Management

The BREEAM rating benchmarks for BREEAM UK new construction projects assessed using the 2018 version of BREEAM are presented in the table below.

BREEAM Rating	% Score Required
Outstanding	≥ 85
Excellent	≥ 70
Very Good	≥ 55
Good	≥ 45
Pass	≥ 30

There are minimum standards associated with the BREEAM 'Excellent' standard in terms of the building's energy and emission performance. However, to ensure that

performance against fundamental environmental issues is not over-looked in pursuit of a particular rating, BREEAM sets minimum standards of performance in key areas e.g. energy, water, materials etc. A BREEAM 'Excellent' rating requires the following minimum performance standards,

BREEAM NC 2018 Issues	Minimum Standards for BREEAM for 'EXCELLENT' rating
MAN 3: Responsible Construction Practices	One credit (responsible construction management)
MAN 4: Commissioning and Handover	One credit (commissioning-test schedule and responsibilities)
MAN 4: Commissioning and Handover	Criterion 11 (Building User Guide)
MAN 5: Aftercare	One credit (commissioning - implementation)
ENE 01: Reduction of Energy Use and Carbon Emissions	Four credits
ENE 2: Energy Monitoring	One credit (First sub metering credit)
WAT 1: Water Consumption	One credit
WAT 2: Water Monitoring	Criterion 1 only
MAT 3: Responsible Sourcing of Materials	Criterion 1 only
WST 03: Operational Waste	One credit

7.2 Potential BREEAM Rating

A BREEAM UK 2018 Non-Domestic New Construction (Commercial: Office) – Shell and Core assessment has been prepared by a qualified, licensed BREEAM Assessor. This determines the feasible credits and potential BREEAM rating for One North Parade and demonstrates a commitment to the principles of good construction, design, and sustainability.

7.3 BREEAM Credit Award Review

An overview of the BREEAM credit award for each issue is presented below. The One North Parade development is targeting a BREEAM rating 'Excellent' and is expected to perform well against the BREEAM criteria.

7.3.1 Management

Project Brief and Design:

Stakeholder consultation covering project delivery and relevant third parties. This is to encourage an integrated design process and considering BREEAM performance targets early to influence decision making and optimise building performance.

Life Cycle Cost and Service Life Planning:

Reporting the capital cost of the building. This will promote the business case for sustainable buildings through the enhanced understanding of capital cost; and,

An outline, entire asset elemental life cycle cost (LCC) plan and a component level LCC option appraisal will be conducted to improve design, specification, through-life maintenance, and operation.

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 conducted/implemented during the construction phase:

- All timber and timber-based products used on the project will be 'legally harvested and traded timber.'
- The principal contractor will demonstrate sound environmental management practices and consideration for neighbours across their activities on-site; and,
- Site related energy and water impacts are monitored and reported to ensure ongoing compliance during the Construction, Handover and Close Out stages and to improve awareness and understanding for future projects. Construction site impacts will be minimised as follows:
 - Monitor, report, and set targets for carbon dioxide or energy arising from site activities.
 - Monitor, report, and set targets for water consumption arising from site activities; and,

- Monitor and record data from the transport movements and impacts resulting from delivery of construction materials to site and construction waste from site.

Commissioning and Handover:

The provision of the following processes and handover guidance will be provided to encourage a planned handover and commissioning process which will reflect the needs of the building occupants:

- A schedule of commissioning including optimal timescales, appropriate testing and commissioning of all building services systems and building fabric in line with best practice will be undertaken.
- Provision of a non-technical Building User Guide and user/operator training timed appropriately around.
- handover and proposed occupation will enable building users to use and manage the building operations efficiently.

Health and Wellbeing

The development will seek to (where viable to do so) enhance the quality of the workspace in building by increased comfort, health and safety of building occupants, visitors and others within the vicinity.

Visual Comfort:

Internal lighting systems will be designed to avoid flicker and provide appropriate illuminance (lux) levels. This will ensure best practice in visual performance and comfort for building occupants.

Internal lighting will be zoned to allow for occupant control; and,
The external lighting strategy will be designed to reduce unnecessary light pollution, energy consumption and nuisance to neighbouring properties.

Indoor Air Quality:

An indoor air quality plan will be produced, with the objective of facilitating a process that leads to design, specification and installation decisions and actions that minimise indoor air pollution during occupation of the building; and,

The building has been designed to minimise the indoor concentration and recirculation of pollutants in the building.

Thermal Comfort:

To ensure that appropriate thermal comfort levels are achieved throughout the design, and controls are selected to maintain a thermally comfortable environment for occupants within the building, the following will be undertaken:

- Thermal modelling will be conducted to appropriate standards.
- Projected climate change scenario(s) will be considered as part of the thermal model; and,
- The thermal modelling analysis will inform the temperature control strategy for the building and its users.

Acoustic Performance:

The building will meet the appropriate acoustic performance standards and testing requirements in terms of:

- Sound insulation.
- Indoor ambient noise level; and,
- Room acoustics.

This will ensure that the building's acoustic performance including sound insulation meets the appropriate standards for its purpose.

- Safety, Security and Surroundings:
- Security needs will be understood and considered in the design and specification. This is to encourage effective measures that promote safe and secure use and access to and from the building.

7.3.2 Energy

Reduction of CO₂ Emissions:

The energy performance of the development will exceed current Building Regulations Part L, Volume 2 (2021) criteria in accordance with the current local planning policies and align with the BREEAM 'Excellent' mandatory requirements.

The proposed approach to emissions reduction at this site will be through a fabric led energy strategy and efficient servicing, in accordance with the principles of the Energy Hierarchy; and low zero carbon technologies in the form of air source heat pumps, will be used for all space heating and hot water loads.

Energy Monitoring:

Energy metering systems will be installed to enable energy consumption to be assigned to end uses; and,

Sub-meters will be provided for high energy load and tenancy areas.

Energy monitoring/metering is a powerful tool to help facilities management to organise and manage their consumption, target certain areas of over-use and streamline controls to improve efficiency over time and seasons.

External Lighting:

The specification of energy efficient light fittings for external areas of the development as follows:

- All new external light fittings within the construction zone will be dedicated low energy (LED).
- External light fittings will be controlled through a time switch or daylight sensor to prevent.
- operation during daylight hours.

Low Carbon Design:

A Passive Design and Low Zero Carbon Feasibility Report will be produced to investigate reductions in the energy demand of the building.

Energy Efficient Transportation Systems:

An analysis of the transport demand and usage patterns will be undertaken to determine the optimum number and size of lifts; This would encourage the implementation of energy efficient and suitably sized systems, and, Energy efficient installations will be specified.

7.3.3 Materials

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.

Materials Lifecycle Impacts:

Materials will be selected which have a low environmental impact throughout their life cycle for the main building elements; and,

An IMPACT compliant Life Cycle Analysis (LCA) tool will be used and an assessment conducted to measure the environmental impact of the building. Through conducting a life cycle assessment and integrating its outcomes in the design decision-making process, the design team will use this tool to measure and aim to reduce the buildings environmental impact.

Responsible Sourcing of Materials:

All timber used on the project will be responsibly sourced in accordance with the UK Government's Timber Procurement Policy.

The contractor will manage responsible sourcing of materials. All timber used within the development will be responsibly sourced, verified by either the Forest Stewardship Council (FSC) or Programme for the Endorsement of Forest Certification standard (PEFC).

Materials will be selected which have a low environmental impact throughout their life cycle.

Suppliers and manufacturers who operate Environmental Management Systems will be prioritised.

Consideration will be given to local sourcing of construction materials where feasible.

Designing for Robustness:

Adequate protection will be provided for exposed elements of the building and landscaped areas, therefore minimising the frequency of replacement materials; and,

Relevant building elements will incorporate appropriate design and specification measures to limit material degradation due to environmental factors.

Material Efficiency:

At the Preparation, Brief and Concept Design RIBA stages; targets will be set, opportunities identified, and methods put in place to optimise the use of materials. This is to avoid unnecessary materials use arising from over specification without compromising structural stability, durability, or the service life of the building.

Construction Waste:

Prior to commencement of the construction phase, the developer will produce a Construction Resource Management Plan to limit the on and off-site environmental impacts of construction. The waste management strategy will also include the following:

Procedures to reduce construction waste related to on-site construction and off-site manufacture/ fabrication.

Diverting non-hazardous construction (on-site and dedicated off-site manufacture/ fabrication), demolition and excavation waste (where applicable) generated by the project from landfill.

Operational Waste:

Provision of suitable space and facilities to allow for segregation and storage of operational recyclable waste volumes generated by the building occupants and activities will optimise recycling rates.

A waste management strategy will be developed, ensuring that adequately sized bin storage areas will be provided, access for collection personnel and vehicles has been established and other aspects of waste management is designed into the development at an early stage of the design. The strategy allows for storage of recyclable materials to optimise the recycling rates achieved by Manchester City Council.

Adaptability to Climate Change:

The creation of a climate change adaptation strategy appraisal which will consider the mitigation measures for more extreme weather events arising from climate change over the lifespan of the building. This strategy aims to minimise the future need of conducting works to adapt the building strategy to take account of more extreme weather changes resulting from climate change and changing weather patterns.

Design for Disassembly and Adaptability:

A building specific adaptation strategy will be undertaken to encourage consideration and implementation of measures to accommodate future changes to the use of the building and its systems over its lifespan. This strategy will ensure that there is no unnecessary materials use, cost and disruption arising from the need for future adaptation works because of changing functional demands and to maximise the ability to reclaim and reuse materials at final demolition in line with the principles of a circular economy.

7.3.4 Biodiversity

Long Term Ecology Management and Maintenance:

Measures will be implemented to manage and maintain ecology throughout the project.

A Landscape and Ecology Management Plan will be developed in accordance with BS 42020:2013.

7.3.5 Pollution

Impact of Refrigerants:

Systems will be specified to reduce the level of greenhouse gas emissions arising from the leakage of refrigerants from building systems.

All systems will be either hermetically sealed, or a permanent automated refrigerant leak detection system will be specified, that is robust and tested, and capable of continuously monitoring for leaks.

Local Air Quality:

Poor air quality has a detrimental effect on humans, fauna, and flora. Gases such as nitrous oxides (NO_x) can react with other gases and environmental factors including sunlight to create substances that have a major impact on health and wellbeing. The 'full electric' energy strategy will result in no local NO_x emissions as the emissions are displaced elsewhere on the grid.

Reduction of Night-time Light Pollution:

The external lighting strategy will be designed to reduce unnecessary light pollution through effective design, minimising energy consumption and nuisance to neighbouring properties.

Reduction of Noise Pollution:

A Noise Impact Survey will be produced demonstrating that the noise levels from the assessed building will be at least 5 Db lower than the background noise throughout the day and night.

8.0 Summary

This Statement has reviewed the sustainability and energy performance of the proposed One North Parade development against national and local planning policies. The conclusion that can be drawn from the review is as per the following:

Sustainability Performance:

- Water consumption of the development will be minimised through the specification of efficient water fixtures.
- CS Policy T1 – Sustainable Transport.
- Compliance with CS Policy EN 8.
- Compliance of the Waste Management Plan with the Council's policies.

Energy And Net Zero Carbon Strategy –

The development provides good access to a range of outdoor green and blue spaces within the wider One North Parade area, including Parsonage Gardens and River Irwell nearby, demonstrating measures in line with the Green and Blue Infrastructure Strategy for Manchester.

A BREEAM Assessment will be undertaken assessing the sustainability performance of the building. The development is targeting an 'Excellent' rating and is expected to perform well against the BREEAM criteria, demonstrating an improvement over the requirements of CS Policy DM 1 - Development Management.

A combination of enhanced building fabric (beyond the regulatory compliance standard), efficient mechanical and electrical systems, and controls will achieve compliance with the emission reduction targets stipulated by Building Regulations Part L (2021).

The offices also benefit from air source heat pumps specified to meet space and water heating requirements. These systems are extremely energy efficient and will play a significant role in reducing the development's carbon footprint.

Local controls will be utilised to ensure maximum thermal comfort and energy savings; and energy modelling to be undertaken to reduce emissions over Part L (2021) of the Building Regulations, demonstrating compliance with CS Policy EN 6 - Target Framework for CO₂ Reductions from Low or Zero Carbon Energy Supplies

A TM54: Operational Energy Performance Analysis has been undertaken.

9.0 Appendix A – Proposed Floor Plans

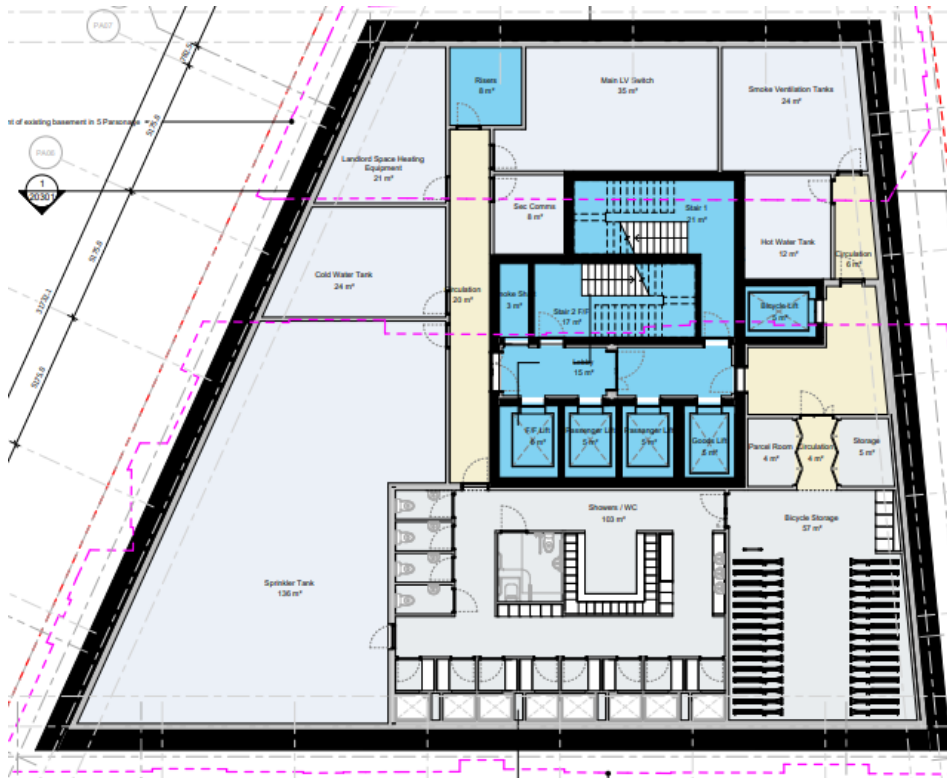


Figure 2. Level B1

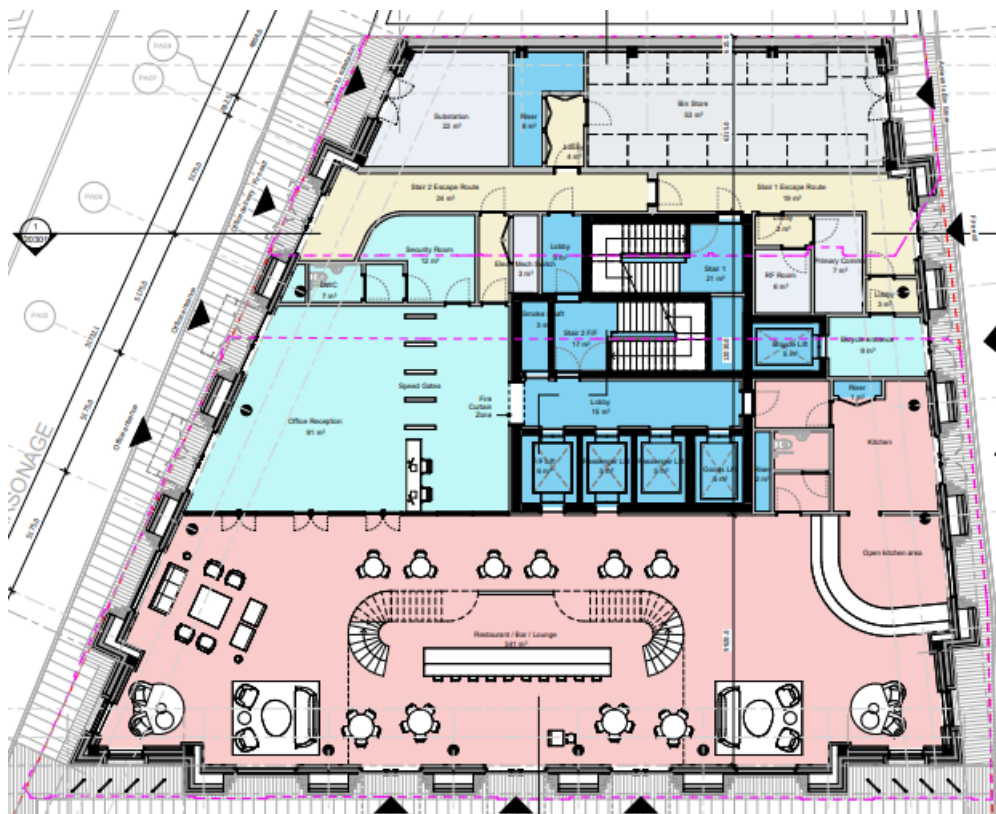


Figure 3. Level GF

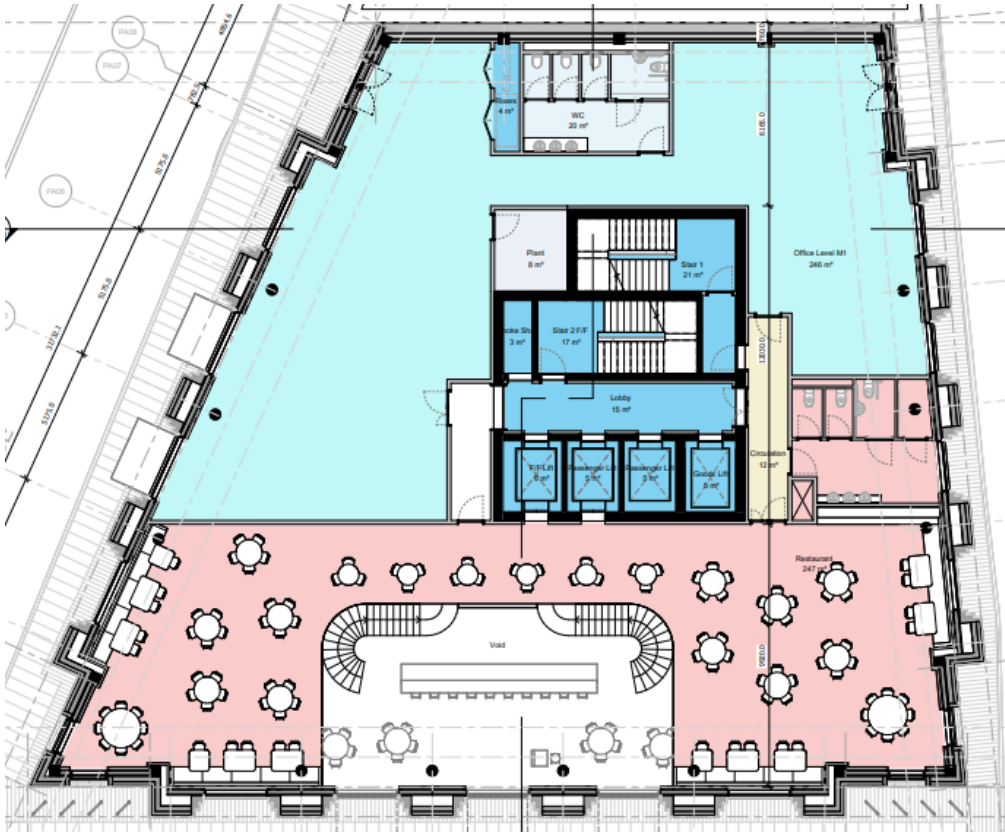


Figure 4. Level M1

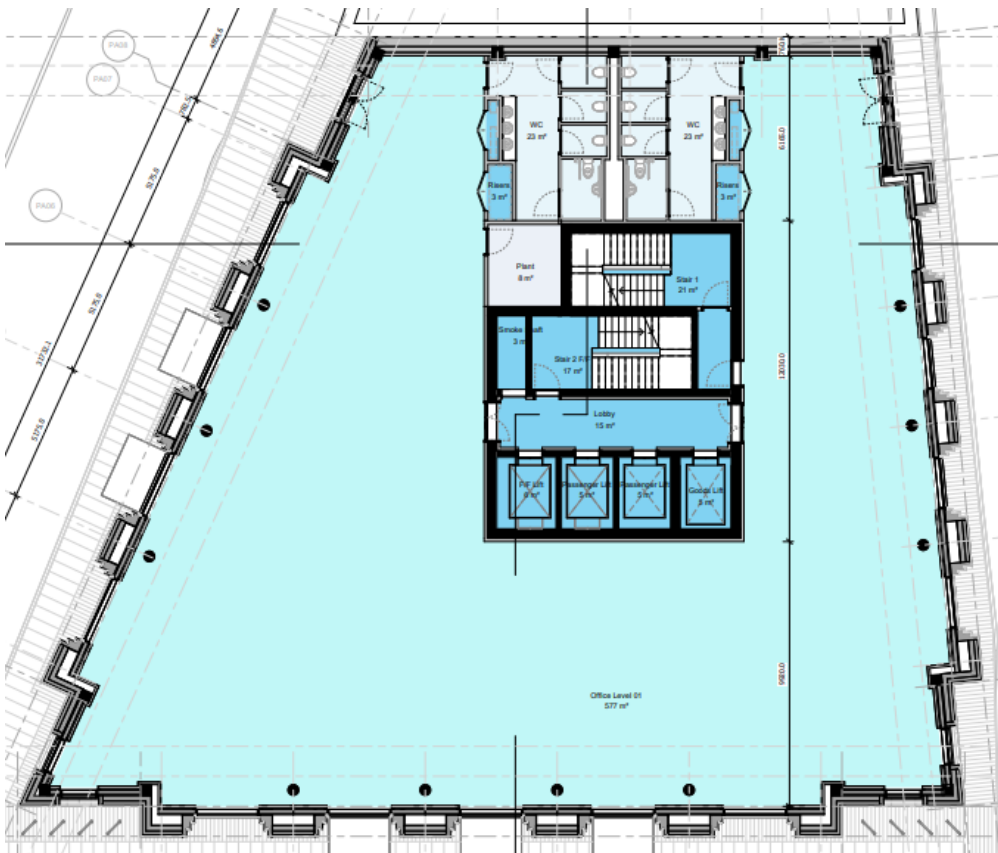


Figure 5. Level 01-10

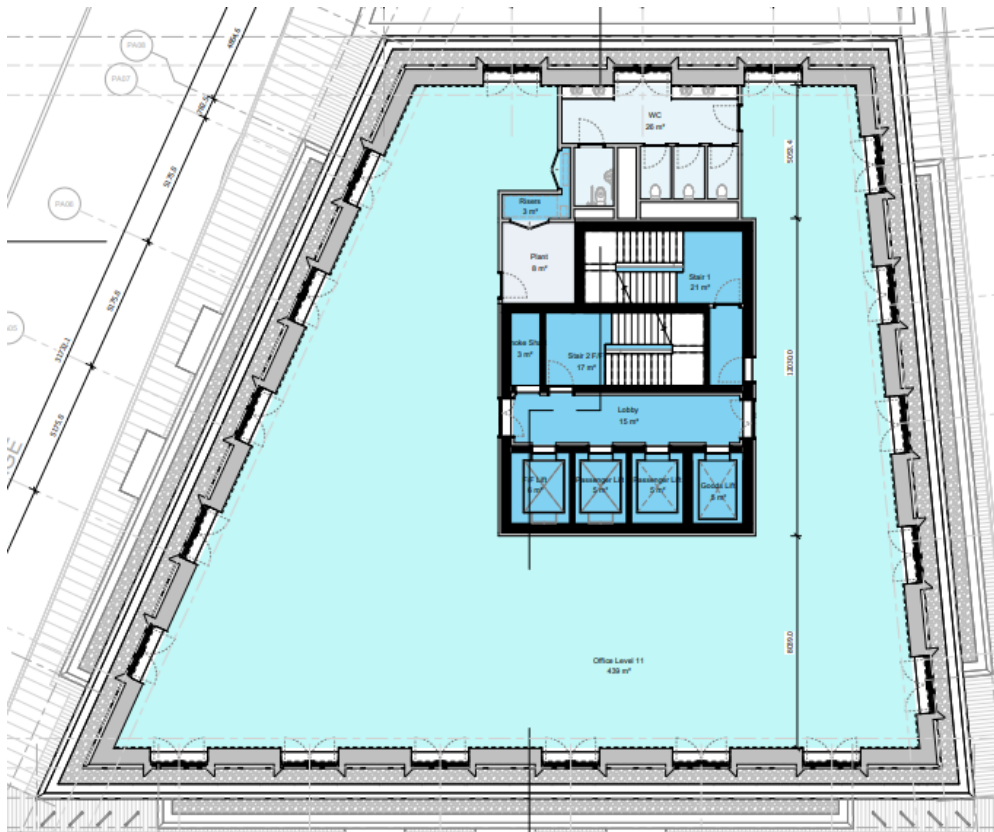


Figure 6. Level 11

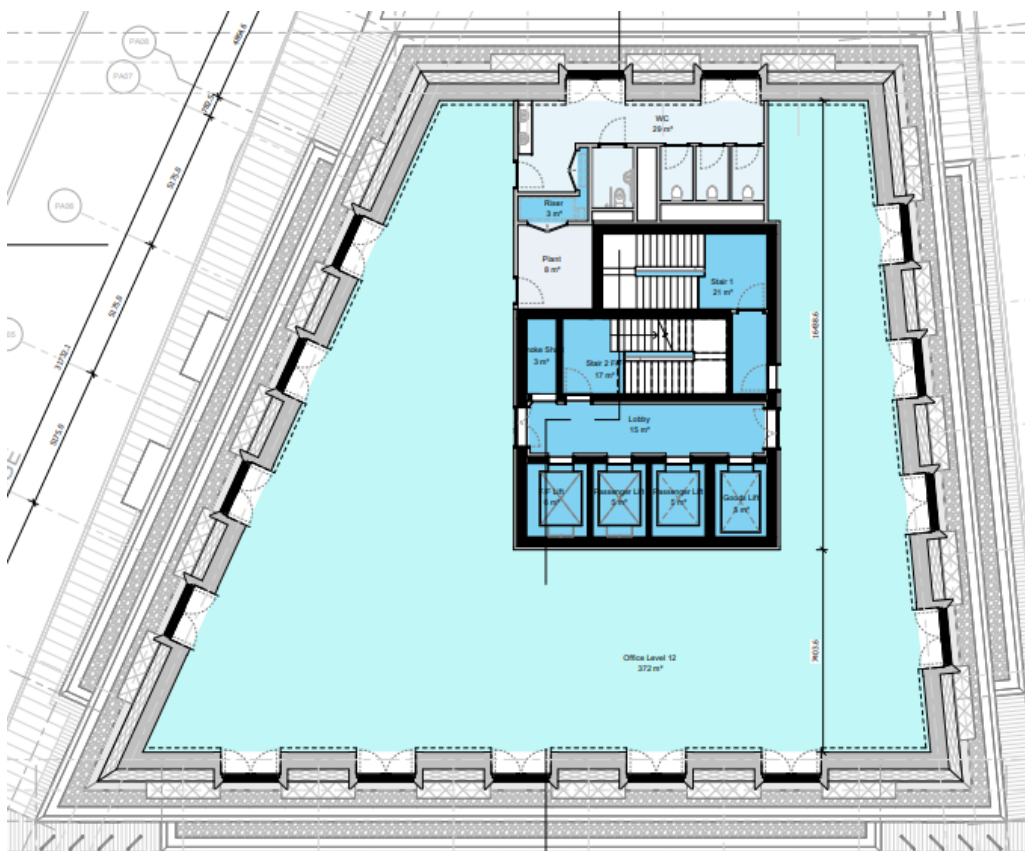


Figure 7. Level 12

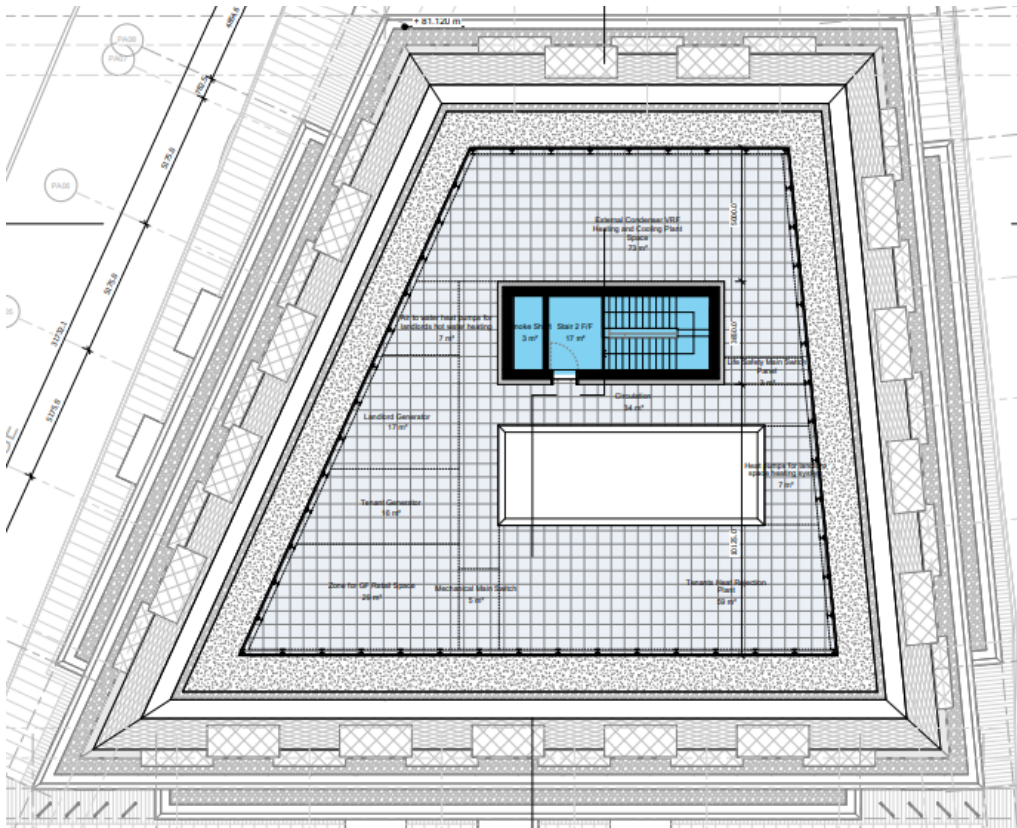


Figure 9. Roof Level

10.0 Appendix B – Climate Change Resilience Risk Assessment (CCRRA)

10.1 Introduction

This Climate Change Resilience Risk Assessment (CCRRA) has been created as part of the ESS (main body of this report) and in line with the IEMA EIA Guide to Climate Change Resilience and Adaptation (IEMA, 2020).

The two key elements to assessing climate change resilience and adaptation issues within EIA, as outlined below:

Climate resilience risks: The proposed development's vulnerability to future climate change has been assessed using a risk-based approach, as recommended by IEMA guidance.

Climate interaction effects: The influence of climate change on the project's environmental impacts has been considered in line with IEMA guidance

10.2 Methodology & Assessment Criteria

Risk assessment

This Climate Change Resilience Assessment follows IEMA guidance and draws on additional sources noted within the main body of this ESS report and additional referenced documents, noted within this Appendix chapter.

Risks are evaluated based on the likelihood and impact, using UKCP18 climate projections¹ and supporting documents such as the Flood Risk Assessment (summarised and referenced within the main body of this report).

Probability

Table 10.1 below outlines the criteria used to rate probability, adapted from IEMA (2020). The assessment covers both construction and operation phases, using a 60-year Reference Study Period from the opening year, in line with BS EN 15978.

¹ <https://www.metoffice.gov.uk/research/approach/collaboration/ukcp>

Table 10.1 - Criteria Used to Determine Probability

Score	Description (probability and frequency of occurrence)
1	The event occurs very rarely during the lifetime of the projects (60 years). For example, once every 60 years (1 event).
2	The event occurs a limited number of times during the lifetime of the project (60 years). For example, once every 25 years (2-3 events).
3	The event occurs regularly during the lifetime of the project (60 years) For example, once every 2- 5 years (12-30 events).
4	The event occurs frequently during lifetime of the project (60 years). For example, once per year (60 events).
5	The event occurs very frequently during the lifetime of the project (60 years). For example, multiple times per year (more than 60 events).

Consequence

Table 10.2 below sets out the criteria for rating the consequences of climate risks, based on their potential impact on the Proposed Development's amenity and function. Amenity refers to elements that enhance user experience, while function relates to how well the development serves its intended purpose (e.g. leisure use).

Table 20.2 - Criteria Used to Determine Consequence

Score	Description
1	Very low but measurable effect on site users and the Proposed Development itself. Slight negative change in amenity value of the Proposed Development and slight negative change in function.
2	Low but measurable effect on site users and the Proposed Development itself. Low negative change in amenity value of the Proposed Development and slight negative change in function.
3	Moderate effect on site users and the Proposed Development itself. Moderate negative change in amenity value of the Proposed Development and slight negative change in function.
4	Moderate effect on site users and the Proposed Development itself. Major negative change in amenity value of the Proposed Development and low negative change in function.
5	Moderate effect on site users and the Proposed Development itself. Major negative change in amenity value of the Proposed Development and moderate negative change in function.
6	Major effect on site users and the Proposed Development itself. Major negative change in amenity value of the Proposed Development and major negative change in function.
7	Extreme effect on site users and the Proposed Development itself. Loss of asset.

Risk rating

Table 10.3 below presents the risk matrix, combining the likelihood of a climate event with the severity of its potential consequences to determine overall risk.

Table 30.3 – Risk Rating Determined Based on the Likelihood and Consequences Score

	Probability					
		1	2	3	4	5
Consequence	1	1	2	3	4	5
	2	2	4	6	8	10
	3	3	6	9	12	15
	4	4	8	12	16	18
	5	5	10	15	20	25
	6	6	12	18	24	30
	7	7	14	21	28	35

	Low risk
	Medium risk
	High risk

Limitations and assumptions

The main uncertainty regarding the CCRRA surrounds the climate change projections that the scheme is assessed against. Climate change projections (e.g., UKCP18) are presented using a set of scenarios that capture the relationships between human choices, emissions, concentrations and temperature change. The UKCP18 climate change projections have been selected, as they are UK specific, and relatively conservative. Some scenarios are consistent with continued dependence on fossil fuels, while others are associated with deliberate actions to reduce GHG emissions. Therefore, these climate change projections contain inherent uncertainty, reflecting the uncertainty associated with quantifying human activities (including technological change) and their influence on climate. There are four Representative Concentration Pathway (RCP) scenarios available in the UKCP18 climate projections: RCP 2.6, RCP 4.5, RCP 6.0 and RCP 8.5. In line with the IEMA (2020) guidance, RCP 8.5 has been used, which represents the most conservative, highest-impact scenario.

Current and Future Baseline Conditions

The below table 10.4 provides a summary of the current baseline climatic conditions, taken from the closest 'climate station' in Buxton, which is circa 20 miles south-east of the Proposed Development. The data provides historic average climatic conditions for 1991-2020, which is assumed to be representative of the baseline year of the assessment (i.e. 2025). The monthly mean minimum/maximum temperatures are calculated from the average of the daily maximum and daily minimum temperatures for each month. The warmest month on average was July and the coolest month on average was January. The wettest month on average was

December and the driest month on average was May. The sunniest month on average was May and the least sunny month on average was December.

Table 40.4 – Baseline Climatic Condition

Month	Mean daily maximum temperature (degrees C)	Mean daily minimum temperature (degrees C)	Days of air frost (days)	Sunshine (hours)	Rainfall (mm)
January	5.52	0.89	11.03	41.13	127.38
February	5.91	0.74	10.85	67.6	116.06
March	8.16	1.83	8.04	104.54	99.95
April	11.17	3.53	3.97	151.28	86.53
May	14.51	6.14	0.67	185.24	82.01
June	17.21	9.07	0	170.75	92.57
July	19.13	11.06	0	182.93	100.82
August	18.65	10.93	0	169.28	101.49
September	15.85	8.8	0	126.83	105.68
October	11.84	6.14	1.8	90.33	141.82
November	8.24	3.37	5.17	52.42	136.34
December	5.93	1.23	9.98	40.32	153.26
Annual	11.87	5.34	51.51	1382.65	1343.91

Climate Change Projections

The UK Climate Projections 2018 (UKCP18) use Representative Concentration Pathways (RCPs) to model future climate scenarios. Following IEMA (2020) guidance, RCP 8.5—the highest-impact scenario—has been used to assess potential climate changes in the UK over the 21st century.

According to UKCP18, projected climate trends over UK land in the 21st century resemble those in UKCP09, with warmer, wetter winters and hotter, drier summers expected—though natural variability means occasional cold or dry winters, and cool or wet summers will still occur.

Temperature

UKCP18 projections show that there is more warming in the summer than in the winter.

Precipitation

Rainfall patterns across the UK are not uniform, varying on seasonal and regional scales, and will continue to vary in the future. While UKCP18 projections show a clear shift to higher probability levels of dry summers, they also suggest that the likelihood of individual wet summers reduces only slightly. The risk of heavy rainfall events is likely to increase.

Sea level rise

According to UKCP18 projections, global sea level has risen over the 20th century and will continue to rise over the coming centuries. The amount of sea level rise depends on the location around the UK and increases with higher emissions scenarios. Sea level rise over the coming centuries may affect tidal characteristics substantially (including tidal range).

Snow

According to UKCP18 projections, for the period 2061-2080, under a high emissions scenario (RCP8.5), the regional (12 km) and local (2.2 km) projections show a decrease in both falling and lying snow across the UK relative to the 1981-2000 baseline.

Wind

There are no compelling trends in storminess, as determined by maximum gust speeds, from the UK wind network over the last four decades. UKCP18 projections over the UK show an increase in near surface wind speeds over the UK for the second half of the 21st century for the winter season when more significant effects of wind are experienced. This is accompanied by an increase in frequency of winter storms over the UK. However, the increase in wind speeds is modest compared to interannual variability.

Winds associated with major storm events can be some of the most damaging and disruptive events for the UK, with implications for property, power networks, road and rail transport and aviation.

10.3 Identification and Evaluation of Risks from Climate Change

Table 10.6 Climate change risk assessment provides a list of potential climate hazards (and hazards exacerbated by climate change), as adapted from the C40 Cities Climate Change Risk Assessment Guidance.

For each potential hazard a risk assessment has been undertaken, prior to incorporation of mitigation, taking into account the probability of the event occurring and the potential consequence, in line with the methodology described earlier in this document. A risk rating has been assessed for each potential hazard, based on matrix set out in Table 10.5.

Table 50.5 – Identification of Future Climate Change Risk

Season	Variable	Time Period	Projected Change At		
			10th percentile	50th percentile	90th percentile
Winter	Mean temperature (°C)	2020 - 2039	-1 to 0	0 to 1	1 to 2
		2040 - 2059	0 to 1	1 to 2	2 to 3
		2060 - 2079	0 to 1	2 to 3	4 to 5
		2080 – 2099	1 to 2	3 to 4	5 to 6
	Mean precipitation change (%)	2020 – 2039	-10 to 0	0 to 10	10 to 20
		2040 - 2059	-10 to 0	0 to 10	10 to 20
		2060 - 2079	-10 to 0	10 to 20	30 to 40
		2080 – 2099	-10 to 0	10 to 20	40 to 50
	Mean daily maximum temp change compared to 1981-2000	2020 - 2039	-1 to 0	0 to 1	1 to 2
		2040 - 2059	0 to 1	1 to 2	2 to 3
		2060 - 2079	0 to 1	2 to 3	3 to 4
		2080 – 2099	1 to 2	3 to 4	5 to 6
	Mean daily minimum temp change compared to 1981-2000	2020 - 2039	-1 to 0	0 to 1	1 to 2
		2040 - 2059	0 to 1	1 to 2	2 to 3
		2060 - 2079	0 to 1	2 to 3	4 to 5
		2080 – 2099	1 to 2	3 to 4	5 to 6
Summer	Mean temperature (°C)	2020 - 2039	0 to 1	1 to 2	1 to 2
		2040 - 2059	0 to 1	1 to 2	3 to 4
		2060 - 2079	1 to 2	3 to 4	5 to 6
		2080 – 2099	1 to 2	4 to 5	7 to 8
	Mean precipitation change (%)	2020 - 2039	-30 to -20	-10 to 0	10 to 20
		2040 - 2059	-40 to -30	-20 to -10	0 to 10
		2060 – 2079	-50 to -40	-30 to -20	0 to 10
		2080 – 2099	-60 to -50	-40 to -30	-10 to 0
	Mean daily maximum temp change compared to 1981-2000	2020 - 2039	-1 to 0	1 to 2	2 to 3
		2040 - 2059	0 to 1	2 to 3	3 to 4
		2060 - 2079	1 to 2	3 to 4	5 to 6
		2080 – 2099	2 to 3	5 to 6	8+
	Mean daily minimum temp change compared to 1981-2000	2020 - 2039	0 to 1	0 to 1	1 to 2
		2040 - 2059	0 to 1	1 to 2	2 to 3
		2060 - 2079	1 to 2	2 to 3	4 to 5
		2080 – 2099	2 to 3	4 to 5	6 to 7

Table 60.6 – Climate Change Risk Assessment

Climate Hazard	Description	Potential Impacts	Change in Likelihood Due to Climate Change	Probability Rating (1–5)	Consequence Rating (1–7)	Overall Risk	Mitigation Required?
Rainstorm	Heavy rainfall with strong winds	Material damage, discomfort	Less frequent but more intense	5	1	5	No
Heavy Snow	Rapid snowfall	Roof damage, injury risk	Less frequent	2	2	4	No
Fog	Low visibility due to suspended droplets	Accident risk	Uncertain	5	1	5	No
Hail	Ice pellets during storms	Discomfort	More frequent	5	1	5	No
Severe Wind	Winds >23 m/s	Damage, injury risk	Stable frequency	4	2	8	Yes
Lightning	A sudden electrical discharge caused by imbalances between storm clouds and the ground, or within clouds.	Damage to buildings and users and pedestrians	Stable frequency	1	6	6	No
Extreme winter conditions	A mix of heavy snow, strong winds, and very cold temperatures.	Damage to building and services (e.g. frozen pipework)	Less frequent	4	3	12	Yes
Cold wave	A period of very low temperatures lasting several days. It can lead to building damage (like frozen pipes) and make outdoor areas uncomfortable or unsafe.	Damage to building and services (e.g. frozen pipework)	Less frequent	4	3	12	Yes
Extreme hot days	Single days where temperatures exceed 30°C. These can lead to overheating, material wear, and health impacts, particularly for older adults.	Damage to building material. Health impacts to occupants.	More frequent	4	4	16	Yes
Heat Wave	Several consecutive days of unusually hot weather, often with high humidity. It can cause overheating in buildings, discomfort for occupants, and health risks—especially for vulnerable groups.	Damage to building material. Health impacts to occupants.	More frequent	4	5	20	Yes

10.4 Increasing the Resilience of the Proposed Development to Climate Change

Table 10.7 summarises the mitigation measures that have been put in place for the proposed development for medium and high-risk elements, to increase resilience to the likely effects resulting from climate change. The mitigation measures included in this table are already included in the design, and do not require further implementation.

Table 70.7 – Climate Change Resilience Measures

Risk	Mitigation measure
Severe Wind	The proposed development will be built to Building Regulations for withstanding severe winds.
Extreme winter conditions	The building fabric and the heating systems (both internally and externally located equipment) will be designed to cater for extreme conditions.
Cold wave	
Extreme hot days	Mechanical cooling systems are proposed to mitigate internal overheating issues.
Heat Wave	An assessment has taken place of CIBSE TM52 to demonstrate internal comfort can still be achieved.

10.5 Conclusion

A set of climate change risks to the proposed development have been identified using the C40 Cities Climate Change Risk Assessment Guidance. These risks have been assessed based on the probability of an event occurring and the consequence if it occurred. Mitigation measures have been identified and have been considered within the design development complete to-date.

It is considered that the residual risks are in line with typical expectations for urban developments of this nature in the UK. Nevertheless, due to the nature and scale of many climate hazards, some level of residual risk remains in some instances. Risks shall be further considered as the building designs progress and additional enhanced mitigation measures considered.