envision

Environmental Standards Statement

Atlas Business Park

ESL 26-0996



22 SEPTEMBER 2026

Revision History

Revision	Date
C	September 2026

Author	Signature
Hebah Gheedan Junior Sustainability and Energy Consultant	[redacted]

Checked and authorised	Signature
Simon Rainsford Director	[redacted]
Joshil Hirani Associate Energy Consultant	[redacted]

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Executive Summary

ES 1.1 Envision has been appointed by Aviva Life and Pensions UK Limited (the applicant) to produce an Environmental Standards Statement with BREEAM Pre-Assessment to support the Application for full planning permission for the construction of seven units (light industrial (Use Class E(g)(iii), general industrial (Use Class B2) and/or storage or distribution (Use Class B8), together with ancillary offices (Use Class E(g)(i)); and associated service yards, parking, landscaping, amenity space and infrastructure, with vehicular access off Simonsway.

ES 1.2 The primary purpose of this statement is to explain how planning policy drivers, which influence the environmental sustainability of the development have been addressed.

Summary of the Sustainability Strategy

ES 1.3 The scheme will deliver a series of sustainability measures which are compatible with Manchester City Council's Places for Everyone sustainability policies and align with Aviva Life and Pensions UK Limited's ESG strategies:

- The scheme is being designed to achieve a BREEAM Excellent rating and various early activities have occurred to inform the sustainable design and construction of the site.
- A Life Cycle Assessment has been undertaken to evaluate materials selections. Workshops have been held with the design team to identify opportunities to reduce up front carbon in the development. This will continue to be monitored in line with Aviva's requirements and BREEAM.
- The site has been subject to a pre demolition audit and opportunities are being considered for reclaiming materials from the existing Vodaphone building for reuse. This statement reports on the circular economy opportunities which will continue to be explored.
- Water conservation measures are proposed to limit potable water use in the units, including water efficiency measures, water sub-metering and a leak detection system.
- The scheme proposes 70 no. Cycle storage Spaces and 20% active EV charging points, with the remaining passive enabled. These measures promote sustainable modes of transport, alongside showers and changing facilities.
- The main contractor will be required to adopt best practice measures to reduce water and energy use through construction.

Summary of the Energy Strategy

ES 1.4 In line with the requirements of Policies JP-S2 the target CO_2 emissions rates and the predicted CO_2 emissions rates for the Proposed Development have been calculated according to the guidance in Part L Volume 2 2021.

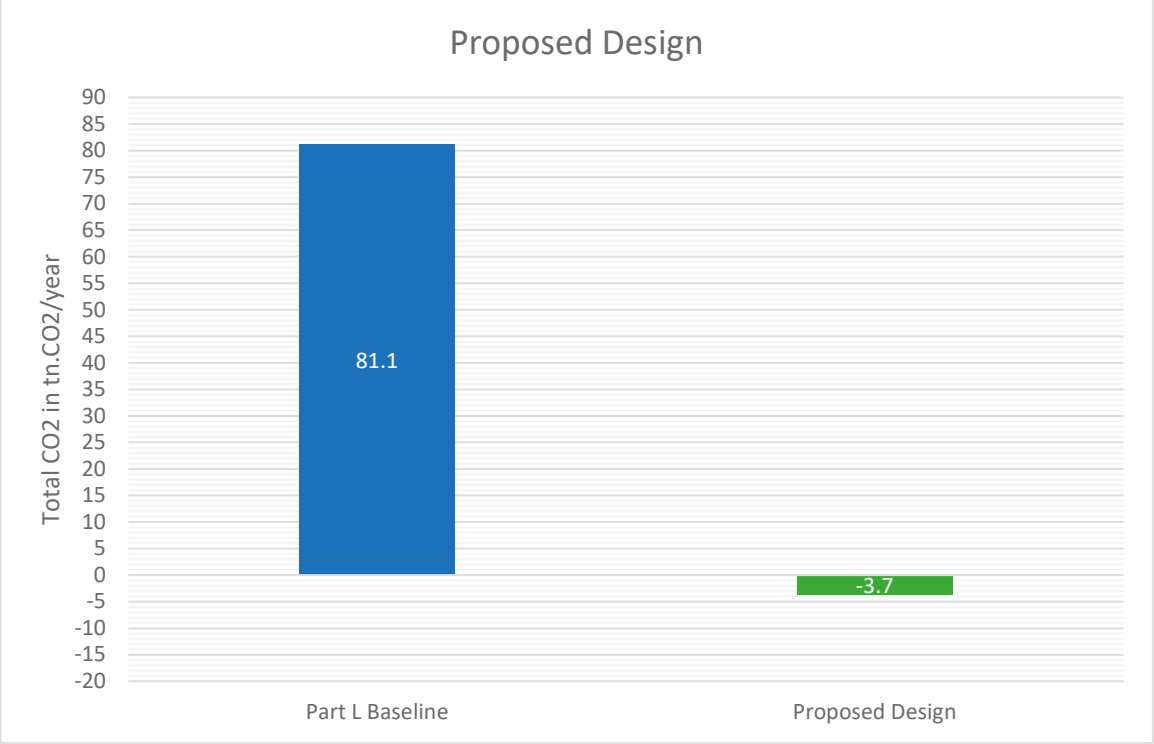
ES 1.5 Envision has followed the guidance outlined in the Approved Document Part L 2021 of the Building Regulations by using Design Builder SBEM to demonstrate that the calculated CO_2 emissions for the

scheme, are in line with best practices. Additionally, the applicant has sought to ensure that the scheme incorporates low carbon or renewable energy generation to achieve regulated carbon emissions that go beyond the requirements of the new Building Regulations Part L.

ES 1.6 To reduce the energy consumption of the development and to assist in achieving a Building Regulation Part L 2021 compliant development, the following design measures are recommended and will need to be incorporated into the detailed design:

- Windows with high performance double-glazed units;
- Building fabric efficiency in line with part L minimum;
- Installation of high-efficiency LED lighting throughout development, including Daylight integration sensors /dimming and occupancy sensing where required;
- Decarbonisation of heating on-site through installation of high-efficiency heat pump systems providing heating and cooling, and;
- Provision of a 1,320 kWp PV array across the roofs for the entire development, with the capacity to increase this arrangement in the future, subject to tenant requirements.

ES 1.7 By following the method as prescribed above and explained in Section 4 of this report, the proposed development would achieve a 104.5% reduction in CO_2 emissions and a 118% reduction in primary energy when compared to a Part L 2021 baseline. These have been checked against the BREEAM Ene 01 calculator and will achieve a minimum of 4 credits, in line with the mandatory requirements of BREEAM Excellent. The Part L BRUKLs verifying these emissions savings have been provided in Appendix I.



ES 1.8 The scheme will be all electric with low Energy Use Intensity and designed to accommodate further photovoltaic panels, should the operators require. Given the extent of the works proposed, the development is therefore considered to have made the fullest contribution to minimising CO_2 emissions in line with the local policy requirements.

1 Introduction

Overview

1.2 Envision has been appointed by Aviva Life and Pensions UK Limited (the applicant) to produce an Environmental Standards Statement with BREEAM Pre-Assessment to support the Application for full planning permission for the construction of seven units (light industrial (Use Class E(g)(iii), general industrial (Use Class B2) and/or storage or distribution (Use Class B8), together with ancillary offices (Use Class E(g)(i)); and associated service yards, parking, landscaping, amenity space and infrastructure, with vehicular access off Simonsway. The primary purpose of this statement is to explain how planning policy drivers, which influence the environmental sustainability of the development can be addressed by the development.

1.3 This statement is structured as follows:

- Section 2 provides a description of the main sustainability policies relevant to the application;
- Section 3 examines the general sustainability features proposed for the development against the policies outlined in Section 2;
- Section 4 provides an Energy Assessment, detailing how the scheme will meet requirements of BREEAM Excellent energy standards in full compliance with Policy JP-S2 of the Places for Everyone Development Plan Document;
- Section 5 offers a concluding summary.
- Appendix I includes the BREEAM Pre-Assessment, demonstrating how an Excellent rating will be achieved.
- Appendix II includes the BRUKL calculations for the development.
- Appendix III GMCA Energy and Carbon Proforma.

Site Location

1.4 The site is located to the east of Wythenshawe town centre within the administrative boundary of Manchester City Council ('MMC' or 'the Council'). The site is located c. 14km to the south of Manchester City Centre. The existing site is accessible via Simonsway, which is located just under c.2.7km from Junction 4 of the M56 Motorway, providing connections to Manchester, Cheshire and North Wales, and subsequently the wider strategic motorway network.

1.5 The site location is shown in Figure 1.1.

Proposed Development

1.6 The proposal is to develop the site with the construction of 7 high quality speculative light industrial buildings for use classes B2 and B8.

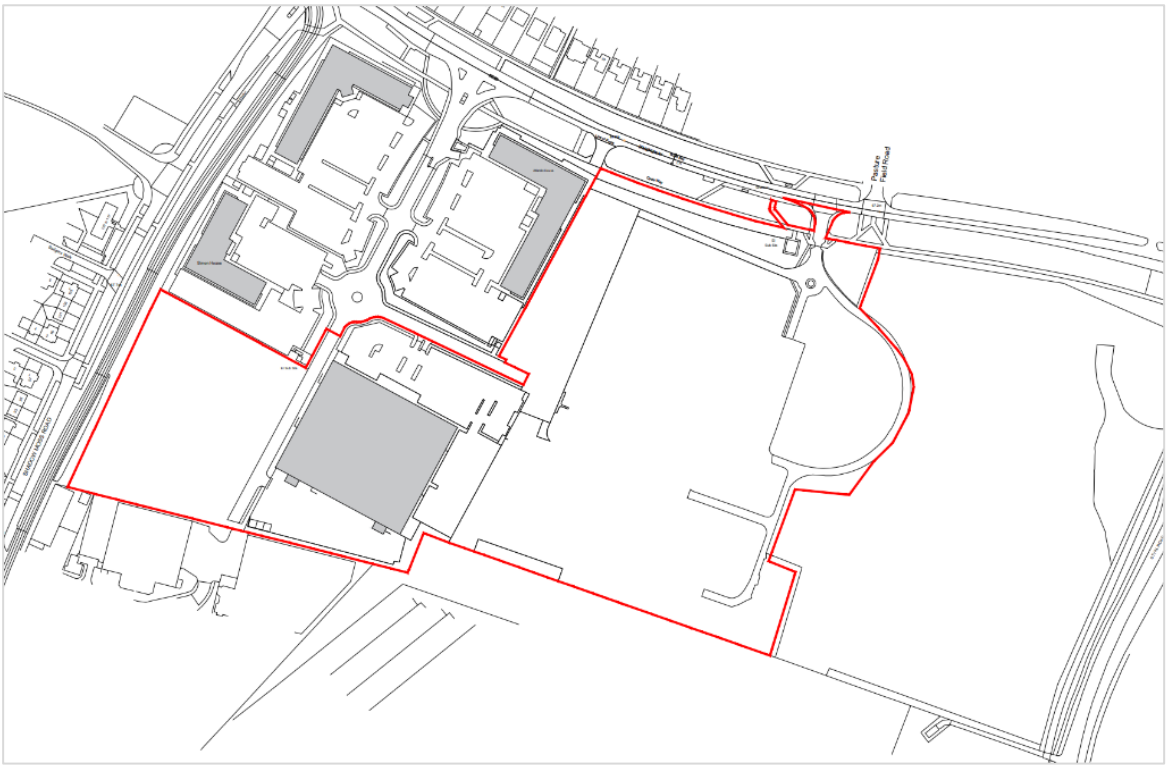


Figure 1.1 Site Location Plan



Figure 1.1.2 Proposed Site Layout

2 Policy Context

2.1 Many definitions of sustainable development exist, although the common objective for all is the integration of economic, social and environmental issues to ensure a better quality of life for people today, without compromising the needs of future generations. A key mechanism for delivering the principles of sustainable development lies within the UK planning system, which is implemented through national guidance and local planning policies. A review of all the relevant policy, regulatory and energy guidance documents was undertaken to gain an understanding of the guiding requirements for sustainability.

National Planning Policy Framework

2.2 The National Planning Policy Framework was Published in August 2026 and sets out the government's planning policies for England and how these are expected to be applied. The NPPF sets out a presumption in favour of sustainable development, with guidance on the presumption for development inside and outside of settlements. The NPPF clarifies that in all locations, development proposals that accord with both an up-to-date development plan and the decision-making policies in the NPPF should be approved without delay.

2.3 Achieving sustainable development means that the planning system has three overarching objectives in providing for the homes, commercial development, facilities and infrastructure which society needs. These objectives are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across all three):

- An economic objective – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;
- A social objective – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering well-designed, beautiful and safe places, with accessible community facilities, public service infrastructure and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and
- An environmental objective – to support efforts to mitigate and adapt to climate change, including moving to a low carbon economy; and to protect and enhance our natural, built and historic environment, including making effective use of land, improving biodiversity, using natural resources prudently, and minimising waste and pollution.

1.1 These objectives should be delivered through the preparation and implementation of development plans and the application of the policies in this Framework; they are not criteria against which every development proposal can or should be judged. Development plans and decisions should play an active role in guiding development towards sustainable solutions, but in doing so should take local circumstances into account, to reflect the character, needs and opportunities of each area.

2.4 The NPPF notes that development plans should take a proactive approach to mitigating climate change and supporting the transition to net zero, in accordance with the objectives and provisions of the Climate Change

Act 2008. The objective being to support the transition to net zero by 2050 and to shape places in ways which are more resilient to the effects of climate change. Policy CC1 states that development plans should also take a proactive approach to adapting to climate change, taking into account the implications of extreme weather and long-term climate trends including overheating, wildfires, drought, flood risk, coastal change, water supply, biodiversity and landscapes.

2.5 In terms of national decision making, policy CC2 confirms that in order to contribute to climate change mitigation and the transition to net zero, development proposals should, where relevant to the proposal:

- (a.) Accord with policies so that sustainable patterns of movement are prioritised, opportunities are taken to improve walking, wheeling, cycling and public transport, and infrastructure is provided to support the transition to zero-emission vehicles;
- (b.) Support good access to facilities in order to limit the need to travel, whether through the development's location, through development densities which improve catchment populations for local services, or by incorporating community facilities and premises to support local employment opportunities;
- (c.) Use design approaches which conserve energy and other resources;
- (d.) Take advantage of opportunities to reuse existing structures and materials, including by reusing non-contaminated excavated soil and hardcore within the site;
- (e.) Take advantage of opportunities to draw low carbon energy from decentralised networks (such as district heat networks), where these are available, and to co-locate energy and heat generators and users, especially to take advantage of suppliers of surplus heat and energy;
- (f.) Contribute to the creation or restoration of habitats which can act as carbon stores, such as through woodland planting and peatland restoration, while avoiding harm to habitats which can act as important carbon stores, including peatland and salt marsh; and
- (g.) Not involve the extraction of fossil fuels unless it is in accordance with policy M5.

1.2 The NPPF makes clear that substantial weight should be given to the benefits of improving the energy efficiency of existing buildings and/or drawing energy from district heat networks, renewable and low carbon sources (including through the installation of heat pumps and solar panels where these do not already benefit from permitted development rights) where this would be achieved through proposals for development.

1.3 In terms of setting standards, Policy PM12 clarifies that standards should not cover matters that are already addressed by Building Regulations, other than in relation to:

- Water efficiency, for which it may be appropriate to apply the tighter Building Regulations optional requirement where justified, or exceptionally a more stringent local standard in areas of serious water stress; or
- Energy efficiency, for which any standards that go beyond the current or proposed Building Regulations should have a clear and robustly costed rationale which shows that there will not be an adverse impact on the viability and deliverability of development. Any such standards should be expressed as a percentage uplift of a dwelling's Target Emissions Rate (TER) calculated using a specified version of the Standard Assessment Procedure (SAP) or other approved calculation methodology.

Places for Everyone (Joint DPD) 2024

1.4 Places for Everyone is a long-term plan of nine Greater Manchester districts (Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan) for jobs, new homes, and sustainable growth. It has been published by the GMCA on behalf of the nine districts.

1.5 The plan is a joint development plan of the nine districts which determines the kind of development that takes place in their boroughs, 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 are sustainably integrated into Greater Manchester's transport network or supported by new infrastructure.

1.6 The Plan includes a section Sustainable and Resilient Places, which includes a raft of policies relevant to sustainable development.

Policy JP-S2: Carbon and Energy

1.7 The aim of delivering a carbon neutral Greater Manchester no later than 2038, with a dramatic reduction in greenhouse gas emissions, will be supported through a range of measures including:

- 1. Promoting the retrofitting of existing buildings with measures to improve energy efficiency and generate renewable and low carbon energy, heating and cooling;
- 2. Promoting the use of life cycle cost and carbon assessment tools to ensure the long-term impacts from development can be captured;
- 3. Taking a positive approach to renewable and low carbon energy schemes, particularly schemes that are led by, or meet the needs of local communities;
- 4. Increasing the range of nature-based solutions including carbon sequestration through the restoration of peat-based habitats, woodland management, tree-planting and natural flood management techniques;
- 5. An expectation that new development will, unless it can be demonstrated that it is not practicable or financially viable;

  a. Be net zero carbon which applies:

  – from adoption – to regulated operational carbon emissions;
  – from 2028 – to all emissions 'in construction'.

1.8 From 2025 development should also calculate and minimise carbon emissions from unregulated emissions alongside regulated emissions.

1.9 Development proposals should set out how this has been achieved in an energy statement in accordance with the energy hierarchy, which in order of importance seeks to:

i. Minimise energy demand;
ii. Maximise energy efficiency;
iii. Use renewable energy;
iv. Use low carbon energy; and
v. Utilise other energy sources.

2.6 From 2025 any residual carbon emissions that cannot be fully mitigated on-site should be offset, in agreement with the relevant local planning authority through a financial contribution to a carbon offset fund.

2.7 As an interim measure, development should be consistent with the 2022 Part L Building Regulations unless superseded by changes to building regulations and/or national or local planning policies.

a. Incorporate adequate electric vehicle charging points, in line with Part S of the Building Regulations, unless superseded by relevant Local Plan policies, to future proof for the likely long-term demand, taking account of the potential maximum energy demand for the site;
b. Where practicable, prioritise connection to a renewable energy/heating/ cooling network in the first instance or a low carbon energy/heating/ cooling network that is adaptable to non-fossil fuels at a later date;
c. In residential developments, achieve energy demand reductions in terms of space heat demand; hot water energy demand and the delivery of on-site renewable energy generation, in accordance with Table 5.1.

2.8 For renewable energy generation priority should be given to PV installation where technically feasible, alternative technologies will be appropriate where the equivalent generation is evidenced.

a. For non-residential developments, achieve at least BREEAM excellent standard (or equivalent) for the 'Ene 01 – reduction of energy use and carbon emissions' category rising to 'BREEAM outstanding' equivalent for ENE 01 from 2028.
b. Include a detailed energy statement to demonstrate via site relevant evidence how the development has sought to maximize reductions in carbon emissions in line with relevant policy targets, including the minimisation of overheating risks and appropriate measures for post occupancy evaluation. Whole life cycle emissions should be considered where possible.

2.9 Districts may set out specific carbon emission reduction and energy demand targets within Local Plans.

Core Strategy (2012)

2.10 The Core Strategy is the key document guiding development around the city. Key policies relevant to sustainability include:

- Policy EN4 - Reducing CO_2 Emissions by Enabling Low and Zero Carbon Development
- Policy EN 6 - Target Framework for CO_2 reductions from low or zero carbon energy supplies
- Policy EN 8 - Adaptation to Climate Change
- Policy EN 9 - Green Infrastructure

Guide to Development in Manchester SPD

2.11 The Guide to Development in Manchester SPD was adopted in April 2007. The document recognises the importance of design in delivering sustainable developments across the city. The SPD provides a set of reasoned principles to guide developers and designers in terms of the development Manchester desires.

2.12 The SPD recognises Wythenshawe through a vision of enhanced growth and change whilst maintaining the distinctive 'garden' identity for the area. The garden concept relates to the original 1945 concept of Wythenshawe as the City's first Garden Suburb. Despite the 'garden feel' of Wythenshawe, the SPD notes that opportunities to integrate higher density development in a sensitive way around local centres and public transport routes, will be welcomed.

2.13 In terms of sustainability, section 4 relates to Environmental Standards. Whilst the standards referred to in the SPD have generally been superseded by the Places for Everyone DPD, the guide provides a framework for addressing sustainability in development proposals.

Design Guidance for Net Zero

2.14 GMCA alongside Etude and Levitt Bernstein have produced a suite of design guidance. The design guide, published on March 2026 focuses on how to design buildings to achieve the net zero ambitions and outcomes set in GMCA policy. The guide is supported by an Energy and Carbon Proforma (currently Version 2) which includes key performance indicators for major non residential buildings. The requirements of the proforma are addressed by this statement and a summary included in Appendix 3.

Aviva Life and Pensions UK Limited ESG Ambitions

2.15 Aviva take a responsible approach to investing and have an ongoing commitment to reach net zero by 2040 through a comprehensive Environmental, Social and Governance framework. Their strong commitments in this space have influence on the development that it brings forward.

2.16 Aviva has developed a set of sustainable design standards for new logistics buildings, supported by the Aviva Investors UK Sustainable Design Brief v5 (Private Markets), which span a range of issues including sustainable construction, low carbon construction and wellbeing. These have influence on the proposed development being brought forward, and include:

- Requirements for Electric Vehicle Charging;
- Roof Mounted PV;
- All electric heating and hot water strategies;
- Low GWP refrigerants;
- EPC A minimum;
- BREEAM Excellent;
- Energy Use Intensity Metrics in line with best practice;
- Climate risk analysis;
- Embodied carbon targets in line with LETI guidance.

3 Sustainability Statement

3.1 This Sustainability Statement identifies the key sustainability features of the development. It draws from the wider application material to demonstrate how the scheme successfully meets with local policy requirements per the Local Plan documents.

3.2 The section is structured in line with the requirements of the Guide to Development in Manchester Supplementary Planning Document and Planning Guidance (SPD) – Section 4, Environmental Standards.

- Energy Efficiency & Renewable Energy
- Environmental Design
- Water Management and Weather Resilience
- Waste Management
- Construction Management
- Biodiversity
- Waterways

Energy Efficiency & Renewable Energy

3.3 The Energy Statement (Section 4) of this document outlines how the proposed development adopts a range of energy reduction measures in accordance with the energy hierarchy, aligning with policy JP-S2 of the Places for Everyone DPD. The Energy Statement confirms that the energy design for the proposed development shall meet all energy demands through electrical systems, meaning that the systems will be fossil fuel free and aiming to achieve an Energy Performance Certificate (EPC) rating of 'A+'. Further details are available in that section and not repeated here.

Environmental Design

Building Orientation and Building Layout

3.4 Building orientation is generally governed by site constraints and the desire to provide dedicated and secure service yards for the units. A Passive Design Analysis has been undertaken as part of the applicant's commitment to BREEAM Excellent which takes account of:

- Building Layout;
- Building Orientation;
- Building Form

3.5 This forms part of the 'fabric first' energy design approach outlined in the Energy Statement (Section 4), per the energy hierarchy, for the proposed development.

BREEAM

3.6 The Guide to Development in Manchester SPD confirms that to demonstrate energy efficiency in non-residential developments, the City Council would encourage developers to use the Building Research Establishment Environmental Assessment Method (BREEAM) which is used to assess environmental performance. Developments should be achieving a design and post-construction rating of "very good." Policy JP-S2: Carbon and Energy (E) confirms that for non-residential developments, achieve at least BREEAM excellent standard (or equivalent) for the 'Ene 01 – reduction of energy use and carbon emissions' category rising to 'BREEAM outstanding' equivalent for ENE 01 from 2028.

3.7 Whilst not a formal policy requirement of Manchester, Aviva opts to apply the BREEAM framework to development, targeting a minimum of Excellent across all categories, including energy.

3.8 A BREEAM pre assessment has been undertaken and progress is being made to align the scheme to the BREEAM framework. The project is applying the BREEAM V6 standards, with which the scheme has been registered against and is being assessed using the similar buildings approach.

3.9 The anticipated performance against the scheme is illustrated in figure 3.1 below.

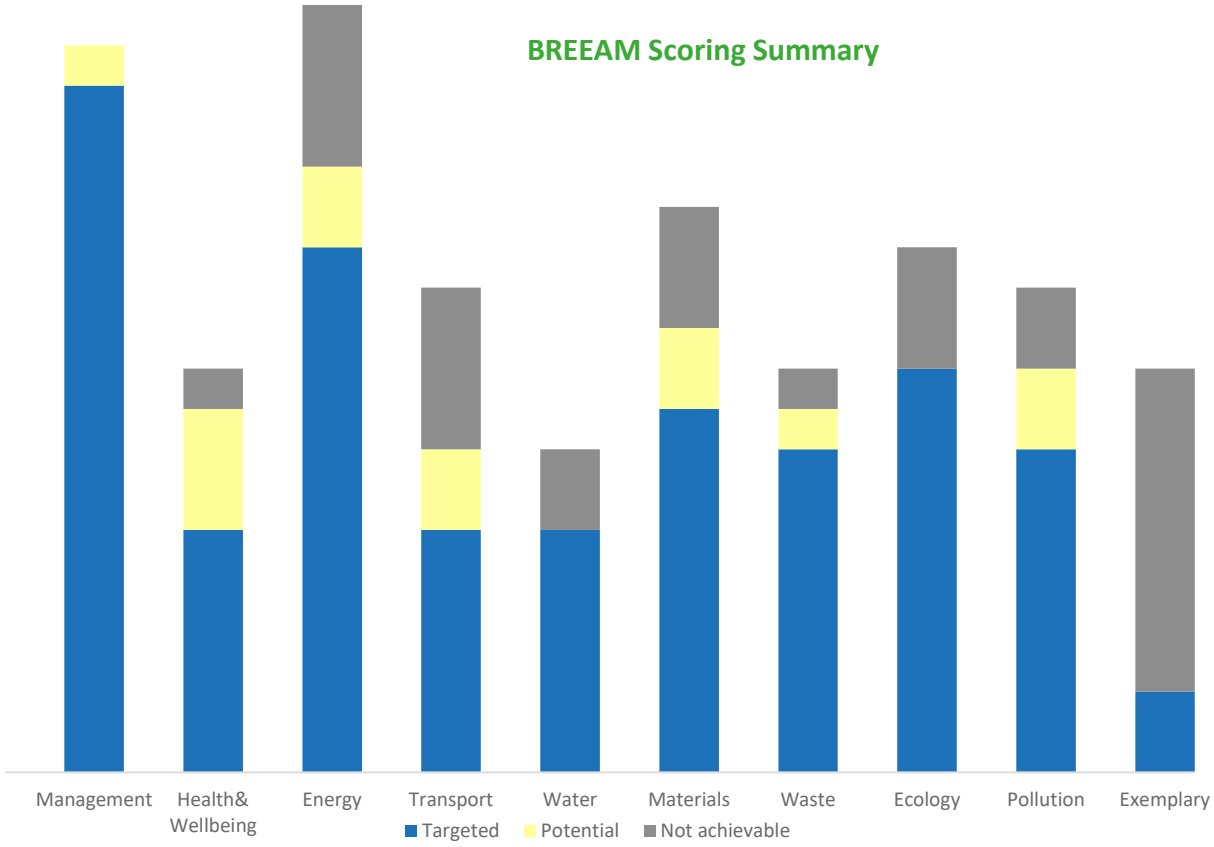
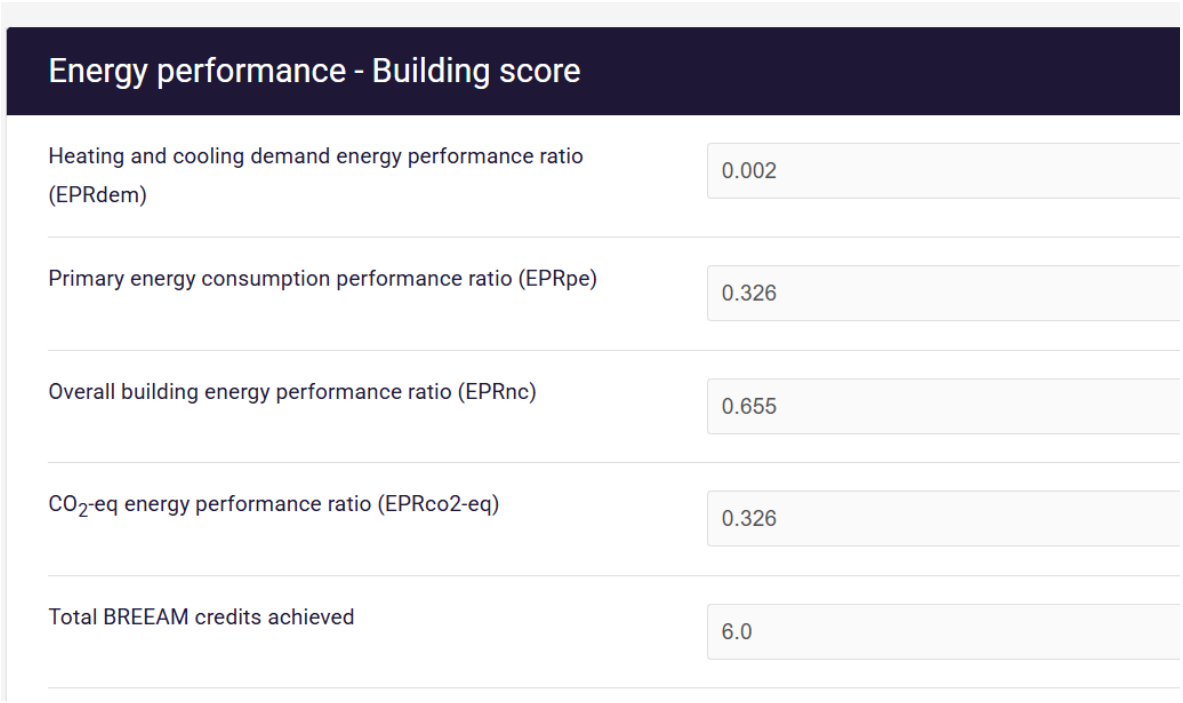


Figure 3.1 – BREEAM Pre Assessment Scoring

3.10 With regards to energy efficiency. A mandatory requirement for BREEAM Excellent is that at least 4 credits are achieved under the Ene 01 section of BREEAM.

3.11 The site wide development achieves 6 credits under BREEAM ENE01, as below.



Energy performance - Building score	
Heating and cooling demand energy performance ratio (EPRdem)	0.002
Primary energy consumption performance ratio (EPRpe)	0.326
Overall building energy performance ratio (EPRnc)	0.655
CO_2-eq energy performance ratio (EPRco2-eq)	0.326
Total BREEAM credits achieved	6.0

Figure 3.2 – INP Extract – site wide BRUKL.inp

Water Management and Weather Resilience

3.12 Policy EN8 of the adopted Core Strategy confirms that all new development will be expected to be adaptable to climate change in terms of the design, layout, siting and function of both buildings and associated external spaces.

Climate Change Adaptation Principles

3.13 Climate change in the UK is expected to increase risk of flooding, storms, overheating and raise concerns about water shortages. When designing new developments, measures must be taken to ensure they can adapt to these climate risks.

3.14 In line with future climate change projections as identified in the UKCP2018, the scheme is being designed to mitigate the impacts of drier summers, wetter winters and increases in average temperatures expected within the building's lifespan. A Climate Change Adaptation has been undertaken during the concept stage of the design to identify the risks associated with climate change, including changing climate and weather patterns in line with the requirements of the BREEAM Wst 05 credit. The strategy will continue to be applied through later design stages, ensuring that climate risks are considered through design and specification.

3.15 The met office provides climate risk data across all local authority areas within the UK. By 2080, Manchester will experience higher summer maximum temperatures for longer periods, whilst winter temperatures will also increase. There will be a general decrease in rainfall in summer months, but an increase in winter rainfall as shown in Figure 3.2.

		0.6°C GWL Baseline 1981-2000	1.0°C GWL Recent Past 2001-2020	1.5°C GWL Paris Agreement	2°C GWL Guidance: Prepare	4°C GWL Guidance: Assess risks
	TEMPERATURE	°C	°C	°C change	°C change	°C change
	Summer Maximum Temperature	28.5 28.1 to 28.8	30.3 28.7 to 31.4	+2.3 +1.0 to +3.5	+2.8 +1.5 to +4.6	+5.9 +5.1 to +7.8
	Summer Average Temperature	16.1 16.0 to 16.1	17.0 16.6 to 17.6	+1.2 +0.7 to +2.0	+1.9 +0.8 to +2.5	+3.9 +3.2 to +4.6
	Winter Average Temperature	5.0 4.9 to 5.1	5.6 5.0 to 6.1	+0.8 +0.3 to +1.3	+1.1 +0.7 to +1.8	+2.7 +1.7 to +3.3
	Winter Minimum Temperature	-5.2 -5.5 to -4.5	-4.2 -5.5 to -2.8	+1.5 +0.4 to +2.6	+1.7 +0.7 to +3.5	+3.1 +1.7 to +4.9
	Annual Average Temperature	10.3 10.2 to 10.3	11.0 10.6 to 11.4	+1.0 +0.6 to +1.3	+1.5 +0.9 to +1.9	+3.3 +2.6 to +3.7
	PRECIPITATION	mm/day	mm/day	% change	% change	% change
	Summer Precipitation Rate	2.23 2.20 to 2.29	2.15 1.91 to 2.46	-6 -22 to +10	-10 -28 to +5	-30 -48 to -19
	Winter Precipitation Rate	2.58 2.52 to 2.64	2.74 2.45 to 3.15	+6 -2 to +28	+12 -1 to +29	+36 +23 to +45

Figure 3.2 – Met office Local Authority Climate Explorer – Manchester

3.16 The design measures which have been incorporated to reduce risks from a changing climate are as follows:

Table 3.1 - Climate Change Adaptation Measures

Identified Risk	Design Measure
Increased Temperature	Climate change will lead to hotter and drier summers in the UK. By 2080, Manchester could expect hot summer days (i.e those days where temperature reaches over 30°c) to increase to 13 days per year. Days where temperatures increase to 35°c will also increase. This will increase the number of days buildings need to be actively cooled. A Thermal Comfort Analysis complying with CIBSE TM52: The Limits of Thermal Comfort: Avoiding Overheating (2013) has been undertaken at the concept stage to evaluate overheating risks and the development's ability to maintain comfortable operational environments for staff and building users. This has considered current and future climate scenarios (DSY1) and future (DSY2 &3) to ensure that the overheating risks of the proposed development are appropriately mitigated. Each unit will be provided with a Cat A specification, including the provision of ASHPs which will be able to regulate internal temperatures with the office areas. Overheating in the main warehousing areas is not considered a risk. The BREEAM process will continue to ensure that thermal comfort levels are delivered in accordance with best practices. Further

Identified Risk	Design Measure
	details on the preliminary overheating analysis are presented in Section 4 of this statement.
Flood Risk	A Flood Risk Assessment has been developed and submitted in support of the planning application. The site lies within Flood Zone 1 according to the Environment Agency Flooding Map for Planning, therefore can be considered to be in an area with a low annual risk (0.1%) of flooding. Further to this, the site is at very low risk from all other sources of flooding, including; tidal, surface water, sewer, groundwater and artificial sources.
Increased Precipitation	Winter precipitation may increase by up to 36% by 2080. To address future flood risk from increased rainfall, the scheme provides a drainage solution which follows the SUDs hierarchy. A Flood Risk Assessment and Drainage Strategy has been developed for the site. In order to prevent flooding downstream, the development will attenuate surface water to greenfield rates and discharge the surface water to the combined sewer, which is considered the most sustainable method for the discharge of surface water as it is the only option available.
Drought	Summer rainfall could reduce by 30% by 2080, leading to increased risks of drought. The building will incorporate water efficiency measures in line with BREEAM Excellent standards, including low flow taps and showers, as well as dual flush WCs. Water usage on each unit will be separately metered: • 6/4 dual flush toilets, incorporating delayed action inlet valves; • Automatic shut off 'push' taps with aeration; • Moderated flow showers, not exceeding 6 litres minute; • Leak detection systems.

Waste Management

3.17 This section outlines how the proposed development shall seek to eliminate waste as the first step, reuse waste as the second step, send waste materials for recycling/reclamation as a third step and ensure waste is sent for energy recovery or safe disposal as a last resort, per the waste hierarchy.

3.18 Policy JP-S6 – Resource Efficiency encourages development to use sustainable design and construction techniques to reduce carbon emissions, adapt and future proof development and reduce and recycle waste and minimise water use.

3.19 A Circular Economy strategy has been developed for the proposed development in line with Aviva's ESG requirements and the provisions of BREEAM. Various design workshops have been held to engage the project team to explore more sustainable practices which promote resource efficiency. This section explains these principles.

Construction Waste

3.20 A waste minimisation study shall be undertaken at the appropriate design stage(s) to explore how measures can be incorporated into the proposed development to minimise material usage and waste generation through the design and construction stages, in line with the requirements of the BREEAM Mat 06 credit.

3.21 The BREEAM Pre-Assessment Strategy (see Appendix I) identifies that has been compiled for the proposed development in support of this application demonstrates that the following targets for diversion from landfill have been targeted per the BREEAM Wst 01 (Innovation) credit, aligning with Criterion MT1 of the Aviva Investors UK Sustainable Design Brief:

- > 90% (by tonnage) Non-Demolition Waste;
- > 95% (by tonnage) Demolition Waste;
- Resource Efficiency Target of 6.5 m^3 per 100 m^2 of floor area.

Reuse of Aggregates and Site-Won materials

3.22 A Pre-Demolition Audit has been undertaken of the existing Vodaphone building which has evaluated the feasibility and opportunities for recovering and reusing materials from the existing development, as well as setting targets for recovery and re-use of the various materials generated by the demolition process, including concrete and cementitious materials. The demolition activities are likely to generate 4,730 tonnes of material, of which approximately 54% are expected to be from concrete which can be crushed and used on site. It is expected that at least 90% by weight of material can be recovered and diverted from landfill, with efforts to reuse as much material as possible on site.

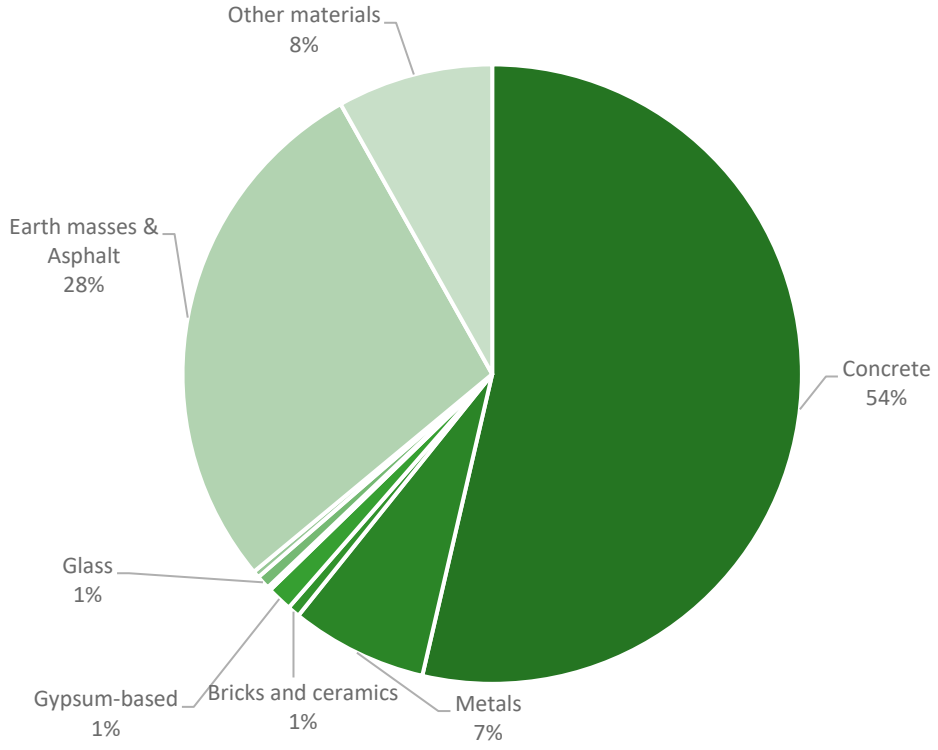


Figure 3.3 – Findings of the Pre Demolition Audit

Sustainable Use of Materials

3.23 The BREEAM Pre-Assessment Strategy (see Appendix I) that has been compiled for the proposed development in support of this application which targets sourcing >20% of the materials for this development with responsible sourcing certification. Materials have been selected that are durable and which are typically used for industrial and logistics facilities.

3.24 To help drive this, a Sustainable Procurement Plan (SPP) has been put in place which mandates the responsible sourcing of materials and products for usage in the proposed development, in line with requirements of the BREEAM Mat 03 credit and complying with the ISO 20400:2017: *Sustainable Procurement – Guidance document.* The SPP shall require that where possible, materials and products procured for the proposed development hold a verified Environmental Product Declaration (EPD) and are locally sourced.

Manging Embodied Carbon

3.25 Preliminary upfront carbon results are set out below. The assessment has been undertaken in alignment with RICS Whole Life Carbon Assessment for the Built Environment (2nd edition) and BREEAM requirements, and structured to meet Aviva's sustainability reporting requirements for the development. The preliminary results are summarised in Figure 3.2 below and have been included in the Proforma found in Appendix III.

3.26 These preliminary figures cover the product and construction stages (Modules A1-A5) on a per unit and site wide basis, and represent the emerging position based on the current design and specification. The project team will continue to interrogate this data through design development, using it to target carbon hotspots, appraise reduction options for structure, envelope and services, and track performance against Aviva's requirements and the BREEAM process ahead of procurement, in line with Policy JP-S2(f) of the Places for Everyone DPD.

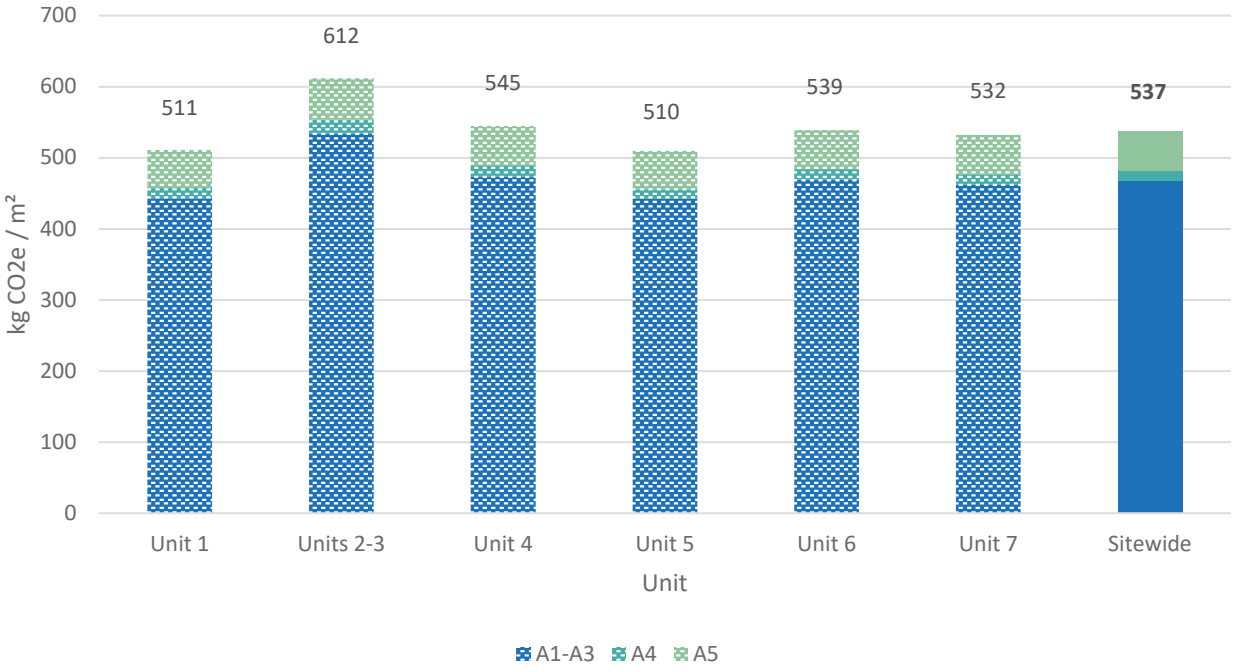


Figure 3.4 Summary of Upfront Embodied Carbon split by Buildings within the Site

Circular Considerations

3.27 A Circular Economy Strategy is being compiled for the proposed development and early workshop have been held to facilitate resource efficiency. This includes the following considerations:

- The structural steel frame provides flexibility in layout of the units to accommodate future uses and various tenant needs.
- Imposed structural loading scenarios will consider different uses and potential future loading to maximise the design for potential different use cases. The slab tolerance can accommodate a range of racking solutions.
- All internal walls will be easily demountable. The office areas will be open plan but can enable subdivision. The use of lightweight metal stud wall construction for the internal partitions between workspaces provides spatial flexibility and adaptability should user requirements change in the future.
- Use of internally durable materials, reduce the amount of maintenance required.
- Cladding systems employed for the facade are independent from the structure and can be demounted at the end of its lifespan. All warehouses have perimeter access making future maintenance straightforward.
- Loose equipment is independent from the rest of the building and can be moved around to suit the internal activity.
- Materials are being reviewed from a whole life-cycle perspective to maximise durability and minimise maintenance requirements.
- The structural materials will be highly durable. The scheme will specify covers for reinforcement to achieve a minimum of a 60 year design life lengthening lifespan.

- Foundations / substructure will be durable to ground conditions / chemical composition of the ground. This will be determined following a Phase 2 investigation.
- Through detailed design flashings and guttering will be designed to avoid water damage and pooling.
- Components will be bolted / screwed rather than pre- welded to enable easy modification / future adaptability and disassembly.
- MEP systems can be repaired / components replaced where possible, rather than replaced. Design will accommodate easy access to the plant equipment to allow for this.

Operational Waste and Recycling Storage

3.28 Dedicated external waste storage is provided for each of the units and sized and located in compliance with the requirements of the BREEAM Wst 03 credit as a minimum. This will provide the tenants with the opportunity to segregate waste into separate waste streams to facilitate recycling. Internal space is also available for balers/compactors, which could be installed by future building occupiers.

3.29 General vehicle servicing has been assessed as part of the Transport Assessment to demonstrate that sufficient space exists for manoeuvring waste vehicles within the service yard areas.

Construction Management

3.30 The project will be taken forward against the BREEAM criteria for construction management, which will ensure that environmental nuisance is minimised as far as possible during the works. A Construction Management Strategy has been prepared by Glencar, who hold significant experience in delivering industrial and logistics sites within the UK. The CMS outlines the measures that will be taken to ensure that the proposed development can be constructed safely, whilst maintaining the continued safe operation of Manchester Airport. The Strategy establishes the overarching construction management principles that will be adopted throughout the demolition, enabling works, infrastructure installation and building construction phases to ensure that temporary construction activities do not adversely affect aircraft operations, airport safeguarding requirements, neighbouring receptors or the surrounding highway network

3.31 Throughout the construction programme, the Principal Contractor will commit to:

- implementing a robust Environmental Management System;
- undertaking regular inspections and audits;
- maintaining high standards of housekeeping;
- providing environmental training for all personnel;
- investigating environmental incidents promptly;
- implementing corrective actions where required;
- maintaining communication with Manchester Airports Group and the Local Planning Authority where appropriate; and
- Continually reviewing environmental performance to identify opportunities for improvement.

3.32 In accordance with the Applicants own ESG strategy, the contractor will explore social value opportunities at the site and report to the Applicant on a quarterly basis regarding performance.

Biodiversity

3.33 Policy JP-G8: Net Enhancement of Biodiversity and Geodiversity, requires development to follow a mitigation hierarchy and achieve a measurable net gain in biodiversity of no less than 10%.

3.34 A Preliminary Ecological Appraisal (PEA) has been undertaken by Lucion to understand the impacts of the proposed development on the existing and surrounding biodiversity present on the site and to outline any mitigation measures that may be necessary during the design and construction phases, per the mitigation hierarchy.

3.35 The Site comprises areas of developed land and buildings, introduced shrubs, neutral grassland, mixed scrub, willow scrub broadleaved woodland, native hedgerows and individual trees. The redevelopment of the site would result in a minor adverse impact upon habitat diversity that, however this is non-significant at a local geographic scale.

3.36 The proposed development includes retained and new landscaping features as detailed on the BEA Design Landscape Strategy drawings. Existing areas of scrub and grassland are to be retained and enhanced around the periphery of the site, as well as the retention of trees which shall be protected om accordance with BS 5837-2012.

3.37 New shrub planting will be introduced, as well as flowering lawns. Areas of wildflower planting and native mixed hedgerows.

3.38 The redevelopment would create an on-site loss of biodiversity, to ensure that the 10% BNG metric can be attained, it is anticipated that an overall net gain in biodiversity value shall be secured via off-Site habitat creation and enhancement, secured via the purchase of off-Site BNG Units.

3.39 In addition, the following measures will be installed on Site:

- A range of bird boxes (25 mm aperture maximum) installed upon suitable retained trees within the Site. The boxes will be erected at least 5 m from ground level in a sheltered, shaded location, facing vegetation.
- Minimum of six roost boxes upon suitable retained trees across the Site. The boxes will be erected at least 5 m from ground level in a south-east, south or south-west facing position, near vegetation, but with a clear flight path to the box.
- An appropriate number of hedgehog boxes, located across suitable retained and proposed areas of woodland and scrub.
- One insect hotel, located within an areas of proposed wildflower grassland.
- Where practicable, log piles formed from the arising from tree removals within the Site.

4 Energy Statement

4.1 This Energy Statement will follow the following energy hierarchy to make best endeavours to reduce carbon dioxide onsite by following a prescribed hierarchy:

- Use less energy and manage demand during operation;
- Use Energy Efficiently: exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly;
- Use Renewable Energy: maximise opportunities for renewable energy by producing, storing and using renewable energy on-site.

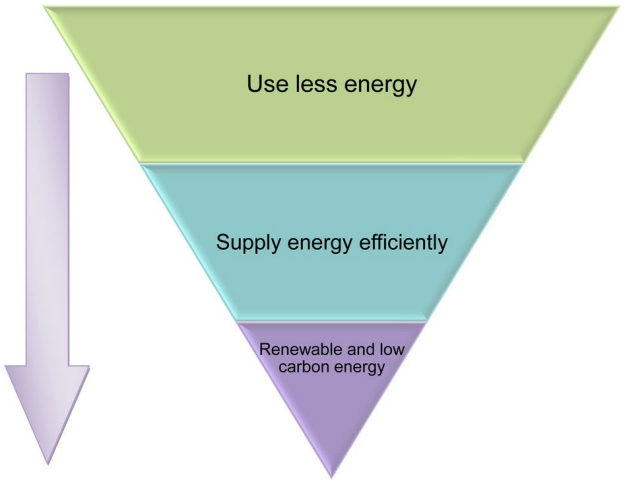


Figure 4.1 Energy Hierarchy

4.2 Places for Everyone Policy JP-S2 – Carbon and Energy has the expectation that new development will, unless it can be demonstrated that it is not practicable or financially viable be net zero carbon, which from adoption of the plan in 2024 means that all regulated operational carbon emission should be eliminated.

4.3 From 2025 any residual carbon emissions that cannot be fully mitigated on-site should be offset, in agreement with the relevant local planning authority through a financial contribution to a carbon offset fund. As an interim measure, development should be consistent with the 2021 Part L Building Regulations unless superseded by changes to building regulations and/or national or local planning policies.

Methodology

4.4 In line with the requirements of Policy JP-S2: Carbon and Energy, the target CO_2 emissions rates and the predicted CO_2 emissions rates for the Proposed Development have been calculated according to the guidance in Part L Volume 2 2021.

4.5 This will be demonstrated through the application of the energy hierarchy where each step will be maximised before the application of the next step. The energy hierarchy can be summarised as:

- Be Lean: reduce energy need
- Be Clean: use energy efficiently

- Be Green: supply energy from renewable and low carbon sources

4.6 In accordance with NCM guidance, the appropriate methodology for calculating energy performance and compliance with Part L of the Building Regulations is through a Dynamic Simulation Model (DSM). The calculations for the Proposed Development were produced using DesignBuilder software version 7.2.0.032, which is a Ministry of Housing, Communities and Local Governments (MHCLG) approved software and methodology for undertaking Part L calculations.

Establishing the Target Emission Rate (TER)

4.7 The total emissions savings calculated in this report for the development is expressed against a Building Regulation 2021 Target Emission Rate. This is the Baseline against which the measures implemented must show an improvement.

4.8 The calculated carbon emissions and total energy demand for the Part L baseline target are illustrated below. The full BRUKL document for the model is shown in Appendix II.

Table 4.1 Target CO_2 Emissions

	Total Floor Area (m^2)	TER ($kgCO_2/m^2/yr$)	Total Target CO_2 ($tnCO_2/yr$)	TPER ($kWh/m^2/yr$)	Total Target Primary Energy (kWh/yr)
Atlas Park	36,866.3	2.2	81.1	23.22	856,035

4.9 The figures of 2.2 $kgCO_2/m^2/yr$ and 23.22 $kWh/m^2/yr$ are the targets that must be reached and improved upon by the proposals in this Energy Assessment in order to comply with Part L Volume 2 2021. This will be achieved through the implementation of fabric efficiency, energy reduction and carbon saving measures as outlined in the ensuing sections.

Applying the Energy Hierarchy

Stage 1 – Be Lean

4.10 The Manchester Local Plan outlines a 'fabric first' approach to reducing the carbon footprint of Manchester's built environment. This is achieved through buildings using less energy by improving u-values, airtightness and lighting efficiency amongst others compared to the Part L minimum values. This is the first step to consider in reducing a building's carbon emissions before the efficient delivery of power, heat or renewables are considered by a design team.

Fabric Efficiency

4.11 U-values are used to measure how effective elements of a building's fabric are as insulators. That is, how effective they are at preventing heat from transmitting between the inside and the outside of a building. Very broadly, the better (i.e. lower) the U-value of a building's fabric, the less energy is required to maintain comfortable conditions inside the building. The following U-values are proposed for the development:

Table 4.2 Proposed U-Values

Elements	Proposed U-values – W/m²K	Comment
External Wall	0.26	n/a
Partition Wall	0.26	Walls adjoining to unheated warehouse
Mezzanine Floor	0.18	Floor above unheated warehouse
Ground Floor	0.18	n/a
Roof	0.18	n/a
External Windows	1.6	G-value 0.4 proposed Light Transmittance 0.65 proposed
Rooflights	1.6	G-value 0.4 proposed Light Transmittance 0.65 proposed
Vehicle Access Doors	1.3	n/a
External Solid Doors	1.6	n/a

Air Permeability

4.12 The designed Air Permeability Rate (APR) has been set at 5 $m^3/h.m^2$ @ 50Pa for the entire development.

Lighting Strategy

4.13 This energy demand will be limited by the application of more efficient lighting, photocell daylight control and use of occupancy controls. The following lighting design requirements are therefore stipulated:

Table 4.3 Lighting Datasheet

Lighting zone	Luminaire Lumens / Circuit Watt	Light Output Ratio	Photocell Dimming (Parasitic Power – W/m²)	Occupancy Sensing (Parasitic Power – W/m²)
Offices	110	1	Yes (0.1)	No
Ancillary Areas (Stairwell/WC/Store)	110	1	No	Yes (0.1)
Warehouse Areas	150	1	No	Yes (0.1)

Ventilation Strategy

4.14 The ventilation strategy will be designed to meet with occupant and client requirements across the activity zones in the development, whilst maintaining the energy efficiency needed to lower carbon emissions. The following strategy is proposed:

Table 4.4 Summary of Ventilation Strategy

Ventilation Zone	System	Specific Fan Power (W/l.s)	Heat Recovery Efficiency
Office	MVHR Supply/Extract AHU	1.4	85%
WC	Extract Only (Remote)	0.3	No

Stage 2 – Be Clean

4.15 Policy JP-S3 (Heat and Energy Networks) of the Places for Everyone Joint Development Plan Document requires major developments to investigate connection to an existing or planned heat network. Where a local heat network already exists, developments should connect to them or be connection-ready unless another energy source would be more sustainable, or connection would not be feasible.

Connection to Existing Heating or Cooling Networks

4.16 The site is not located in a Heat Priority Area, nor do existing networks exist in the vicinity of the site. The industrial units are expected to have limited heating and hot water demands, which would not warrant an on-site network or capability to connect into future networks, should these become available.

4.17 The scheme comprises of low heat intensity buildings. The majority of floorspace is expected to be unheated and it is proposed that the areas which are heated will be served by high efficiency heat pumps operating at the building level, rather than communally across the site. In general, the loads are limited rendering heat

networks impractical and unviable. In general, there appears to be limited benefit for connecting the scheme into future heat transmission networks.

Stage 3 – Be Green

4.18 An analysis of low carbon/renewable technologies was undertaken to determine which would be suitable for application in a development of this size and nature. This determined that the renewable systems deemed to be the most suitable for the development is the use of air source heat pumps providing renewable heating to the office areas, and roof mounted PV.

Low Carbon/Renewable Technology System 1 – Air Source Heat Pumps

4.19 The first low carbon/renewable energy system proposed for the development is an air source heat pump (ASHP) serving the office areas within the building. ASHPs with the following specifications have been assumed:

- The proposed ASHP is a conventional VRF air source heat pump system and will serve the office areas;
- The ASHP will be selected to operate on R32 or R410a which is an F-Gas compliant refrigerant;
- Cooling plant will have a minimum Energy Efficiency Ratio (EER) of 4 and SEER of 6;
- The ASHP will have a minimum COP of 4.0 for heating;
- HVAC system controls installed will be operating efficiently include automatic monitoring and targeting with alarms for out-of-range values as well as local time and temperature control.

4.20 The back-of-house heating will consist of heating provided by direct electric panel heaters. Hot water will be provided by instantaneous point-of-use systems. As this will be serving very small areas, this is deemed to be the most suitable solution.

Low Carbon/Renewable Technology System 2 – PV (Photovoltaic) Array

4.21 The second low carbon/renewable energy system proposed for the development is a photovoltaic (PV) array. The proposed PV will be roof mounted. The building design will provide suitable penetrations/risers to allow the roof mounted inverter to be wired back to a distribution board and G59 intake meter arrangement.

4.22 Included in the table below is a break-down of the proposed PV array:

Table 4.5 PV Array Details

	PV kWp	PV Area in m^2	PV Generation in (kWh/annum)
Atlas Park	1,320	5404	878,155

4.23 This energy assessment has identified a roof mounted PV array of 1,320 kWp will generate 878,155 kWh of renewable electricity per annum and will result in a reduction of 106,912 kg CO_2 per annum.

Part L Results

4.24 The following table shows the results from the Part L 2021 calculations.

Table 4.6 Part L Results

	Total Floor Area (m^2)	BER ($kgCO_2/m^2/yr$)	Total CO2 ($tnCO_2/yr$)	BPER ($kWh/m^2/yr$)	Total Building Primary Energy (kWh/yr)
Atlas Park	36866.3	-0.1	-3.7	-4.18	-154,101
% Savings		**104.5**		**118.0**	

4.25 As detailed above, the measures as taken at this stage would result in a 104.5% reduction in the new build regulated CO_2 emissions over the Building Regulations Part L 2021 Target Emission Rate and a 118.0% reduction in the new build regulated primary energy over the Building Regulations Part L 2021 Target Primary Energy Rate. This is therefore in compliance with the requirements of the Manchester Local Plan.

5 Conclusion

5.1 Envision has been appointed by Aviva Life and Pensions UK Limited to produce an Environmental Standards Statement with BREEAM Pre-Assessment and BRUKL calculations to support an Application for full planning permission for the construction of seven units (light industrial (Use Class E(g)(iii), general industrial (Use Class B2) and/or storage or distribution (Use Class B8), together with ancillary offices (Use Class E(g)(i)); and associated service yards, parking, landscaping, amenity space and infrastructure, with vehicular access off Simonsway.

5.2 The following conclusions can be drawn from the statement:

Energy Efficiency & Renewable Energy – The proposed development is in full accordance with JP-S2 – Energy and Carbon of the Places for Everyone Joint DPD. This requires that before 2028, new development will be net zero carbon for regulated operational carbon emissions. Section 4 of this statement includes an energy strategy which demonstrates how this is to be achieved by following an energy hierarchy. The proposed development includes efficient building fabric, high standards of air tightness and efficient all electric systems, alongside roof mounted PV. The strategy demonstrates that no further carbon offset is required for the development as the design achieves net zero regulated energy and aligns with BREEAM excellent standard (or equivalent) for the 'Ene 01 – reduction of energy use and carbon emissions.

Environmental Design – The development is targeting a BREEAM Excellent rating and is expected to score highly across the various categories of BREEAM. It is proposed that the development would reach BREEAM Excellent against the BREEAM New Construction Standards Version 6, for which the scheme has been registered and designed against.

Water Management and Weather Resilience – The development is consistent with Core Strategy Policy EN8, in that it is adaptable to future climate change. An assessment has been undertaken which demonstrates how the buildings and site infrastructure have factored in future climate risk in line with projections from the UKCP2018. The risks of increased temperature and changes to rainfall patters have been factored into the scheme design.

Waste Management – Policy JP-S6 – Resource Efficiency encourages development to use sustainable design and construction techniques to reduce carbon emissions, adapt and future proof development and reduce and recycle waste and minimise water use. To facilitate the development, it is necessary to demolish the existing Vodaphone office building, which has reached end of life. A pre demolition audit has been undertaken to evaluate the material that could be recovered and reused on and off the site, with the objective to divert at least 95% of the material (by weight) from landfill. The design has been informed by Whole Life Cycle Assessments and life cycle costing, with the objectives to ensure a long life and low Maintenance cycles.

Construction Management – The scheme will be delivered to address a comprehensive set of environmental mitigation, alongside a plan to minimise disruption from construction and maintain airport safeguarding. A Construction Management strategy has been put forward which illustrates how these factors can be achieved. The Applicant will also require the future contractors to pursue social value objectives, promoting positive outcomes within the local community

Biodiversity – Policy JP-G8: Net Enhancement of Biodiversity and Geodiversity, requires development to follow a mitigation hierarchy and achieve a measurable net gain in biodiversity of no less than 10%. The

proposed development will follow the mitigation hierarchy. A landscape scheme has been put forward with the objective to retain perimeter landscaping and trees, wherever possible. Biodiversity Net Gain will be achieved through a combination of on-site measures, and off-site credits.

Appendix I

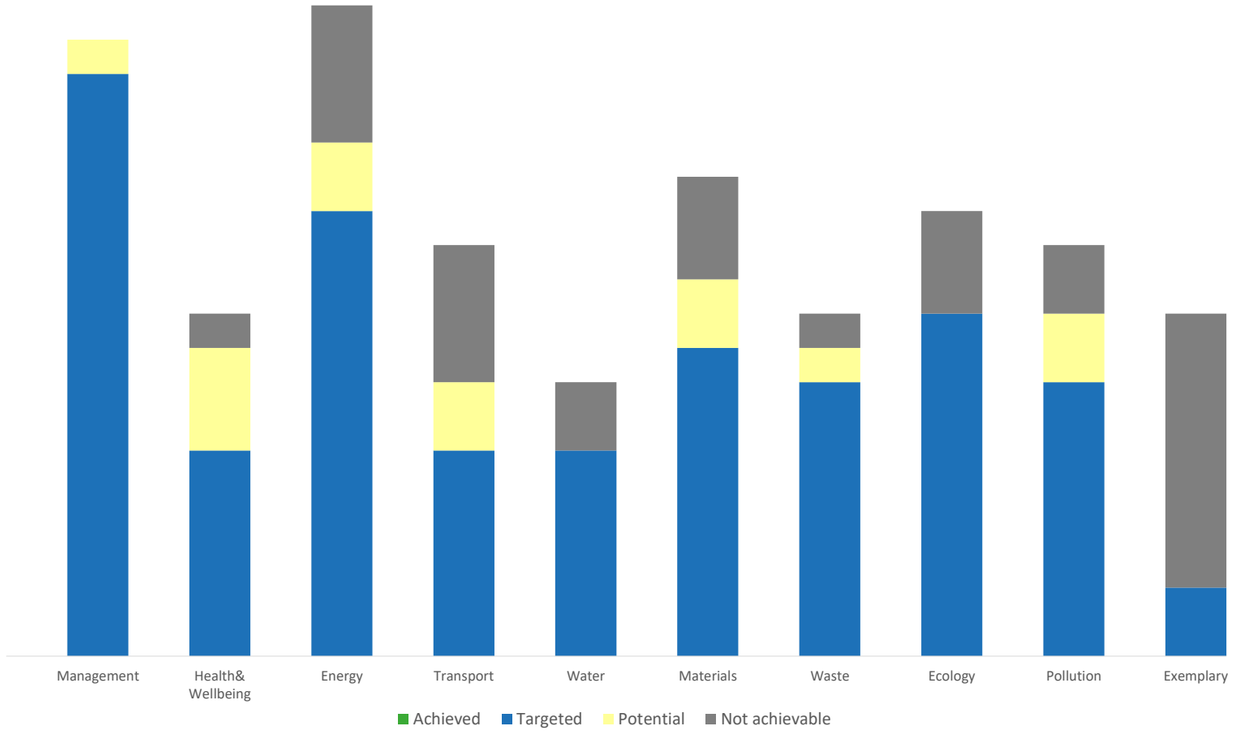
BREEAM Pre-Assessment Strategy

Issue	Date	Reason for Issue	Author	Approved

Project Name: Atlas Park
Prepared for: Aviva Life and Pensions
Building Type: Industrial
Project Stage: Pre-Assessment
Scheme: v6
Manual Version: SD5078 Issue 3.0
Project type: Shell and Core
Target Score: Excellent

Key Statistics

Will the building be heated and/or cooled?	Yes
Commercial/industrial refrigeration and storage systems	No
Building user transportation systems (Lifts)	No
Building user transportation systems (Escalators / moving walks)	No
Is demolition occurring under the developer's ownership?	Yes
Laboratory function/area and size category	No Laboratory
Laboratory containment level	No
Fume cupboards and/or containment devices	No
Are WC failities only provided within the residential areas of long term stay?	No
Unregulated water uses present? (e.g. vehicle wash system, irrigation)	No
Does the building have external areas within the boundary of the assessed development?	Yes
Are there statutory requirements, or other issues outside of the control of the project, that impact the ability to provide outdoor space?	No



Lower Ground Floor, 24 Charlotte Street, Fitzrovia, W1T 2ND
Unit 2 Lodge Farm Business Centre, Castlethorpe, Milton Keynes, MK19 7ES
Howbery Business Park, Benson Ln, Wallingford, OX10 8BA
+44 (0)207 4860680
www.envisioneco.com

Project Name: **Atlas Park**
Building Type: **Industrial**
Project Type: **Shell and Core**

Targeted BREEAM rating % **72.16** **Excellent**
Potential BREEAM rating % **83.26** **Excellent**
Achieved scoring % **0.00**

Credit Ref.	Credit Title	Credit Name	Available	Targeted	Potential	RIBA Stage	Comments / Actions
MANAGEMENT							
Man 01	**Project Brief and Design**	Project Delivery Planning	1	1		2	A clear sustainability brief developed prior to concept design. Identify and define roles, responsibilities and contribution of project team for key phases of the project delivery.
		Stakeholder Consultation (Interested Parties)	1	0	1	2	Consult all relevant parties on minimum consultation content at RIBA Stage 2. Prior to completion of RIBA Stage 4 feedback to all relevant parties must be given and received.
		Pre-requisite for BREEAM Advisory Professional credits: Have the client & the contractor formally agreed performance targets?				2	**BREEAM target must be formally agreed with the design team.**
		BREEAM Advisory Professionals (AP) (Concept Design)	1	1		2	Appointment of BREEAM AP prior to RIBA Stage 2. BREEAM target must be formally agreed with the design team.
		BREEAM AP (Developed Design)	1	1		4	BREEAM AP monitor and report progress against agreed BREEAM performance targets throughout the project up to PC Stage.
Man 02	**Life Cycle Cost and Service Life Planning**	Elemental Life Cycle Cost (LCC)	2	2		2	An outline, entire asset elemental life cycle cost plan has to be carried out at RIBA stage 2 in line with Standardised method of life cycle costing for construction procurement PD 156865:2008.
		Component Level Life Cycle Cost Options Appraisal	1	1		4	A component level LCC plan has been developed by the end of RIBA Stage 4 in line with 'Standardised method of life cycle costing for construction procurement' PD 156865:2008.
		Capital Cost Reporting	1	1		4	Report the capital cost for the fit-out works in pounds per meter square (£/m2) via the BREEAM Assessment Scoring and Reporting tool.
Man 03	**Responsible Construction Practices**	**Pre-requisite: Legal and sustainable timber**				4	**All timber and timber-based products used during construction process of the project are legal and sustainable i.e. FSC or PEFC certified.**
		Environmental Management	1	1		4	Contractor operates EMS: certificate of ISO 14001, EMAS or have a structure that is in compliance with BS 8555:2003 and has reached stage four of the impleentation stage. And implement best practice pollution prevention procedures: PPG6, Pollution Prevention Guidelines.
		Pre-requisite for BREEAM AP on site: Have the client & the contractor formally agreed performance targets?				4	**BREEAM target must be formally agreed with the main contractor.**
		BREEAM AP (Site)	1	1		4	A BREEAM AP is appointed to monitor the project to ensure ongoing compliance with the relevant sustainability performance/process criteria, and therefore BREEAM target, during the Construction, Handover and Close Out stages.
		Responsible Construction Management **Minimum Standard: 1 credit Excellent, 2 credits Outstanding**	2	2		4	Principal contractor achieves score register the site under the Considerate Contractors Scheme (CCS) or Fleet Operator Recognition Scheme (FORS) and achieves score required for targeted credits.
		Monitoring of Construction Site Impacts - Utility and Water Consumption	1	1		4	Principal contractor monitor energy and water consumption on site.
		Monitoring of Construction Site Impacts - Transport of Construction Materials and Waste	1	1		4	Principal contractor to monitor fuel consumption of transport of materials and waste to/from site.

Credit Ref.	Credit Title	Credit Name	Available	Targeted	Potential	RIBA Stage	Comments / Actions
Man 04	**Commissioning and Handover**	Commissioning - Testing Schedule and Responsibilities **Minimum Standard: 1 credit Very Good, Excellent and Outstanding**	1	1		4	Third party commissioning manager to be appointed. Testing schedule and responsibilities to be provided.
		Commissioning - Design and Preparation	1	1		4	Appointment of an appropriate project team member, provided they are not involved in the general installation works provide commissioning management.
		Testing and Inspecting Building Fabric	1	1		4	Thermographic survey to be undertaken by professional holding a UKTA certificate and an airtightness test undertaken by professional holding with membership of ATTMA or IATS.
		Building User Guide **Minimum Standard: 1 credit Very Good, Excellent and Outstanding**				4	2 sets of building user guides to be developed: a technical and non-technical
		Handover	1	1		4	A training schedule is prepared for building occupiers at handover including proposed occupation plans (introduction to Building User Guides, installed systems an key features, O&M manual, commissioning records, aftercare information).
HEALTH & WELLBEING							
Hea 01	**Visual Comfort**	Daylighting	1	1		3	Daylighting study to be carried out and achieve average daylight factor of 2% over 80% (100% room dependant) of the floor plate and a uniformity ratio of at least 0.3.
		View Out	1	1		3	95% of the floor area in 95% of spaces for each relevant building area is within 8 m of an external wall. The window or opening must be ≥ 20% of the surrounding wall area or compliance is seeked via BS 8206.
		Internal and External Lighting Levels, Zoning and Controls	1	1		4	Internal lighting designed to provide lux levels in accordance with SLL Code for Lighting, CIBSE LG 7 and other relevant industry standards; and zoned to allow occupant control. External lighting designed in accordance with BS5489-1:2013 and BS EN 12464-2:2-14.
Hea 02	**Indoor Air Quality**	**Pre-requisite: Indoor Air Quality (IAQ) Plan**				2	**IAQ Plan to be developed no later than RIBA Stage 2.**
		Ventilation	1	0	1	4	Provide fresh air into the building in accordance with the criteria of the relevant standard for ventilation. Consideration of carbon dioxide (CO_2) or air quality sensors. Design intakes and exhaust 10m apart and from sources of external pollution or in accordance with BS EN13779:2007 Annex 2.
Hea 04	**Thermal Comfort**	Thermal Modelling	1	1		3	Thermal modelling to be carried out in accordance with CIBSE AM 11.Air conditioned building to be designed in accordance with CIBE Guide A and the PMV & PPD to be reported; for naturally ventilated builidng consider overheating in line with CIBSE TM52/TM59.
		Design for Future Thermal Comfort	1	1		3	The thermal modeling demonstrates the building is designed for a projected climate change environment and for conditioned building report PMV & PPD.
Hea 05	**Acoustic Performance**	Acoustic Performance	1	1	0	3	Meet relevant acoustic performance standards for sound insulation, indoor ambient noise levels and reverberation. Suitably qualified acoustician to undertake calculation and testing requirements.
Hea 06	**Security**	Security of Site and Building	1		1	2	Security Needs Assessment (SNA) undertaken by Suitably Qualified Security Specialist (SQSS) during RIBA Stage 2 and design embodies recommendations. Any deviation from recommendations to be justified and agreed with SQSS.
Hea 07	**Safe and Healthy Surroundings**	Safe Access	1	0		4	Dedicated and safe cycle paths are provided from the site entrance to any cycle storage, and connect to off-site cycle paths. Pedestrian drop-off areas, delivery areas, dedicated parking or waiting areas are designed for vehicles.
		Outside Space	1		1	4	There is an outside space providing building users with an external amenity area.

Credit Ref.	Credit Title	Credit Name	Available	Targeted	Potential	RIBA Stage	Comments / Actions
ENERGY							
Ene 01	**Reduction of Energy Use and Carbon Emissions**	Energy Performance **Minimum Standard: 4 credits Excellent, 6 credits Outstanding**	9	4	2	2	Credits are achieved through energy modelling (BRUKL report) and reduction in regulated CO_2 emissions.
		Prediction of Operational Energy Consumption **Minimum Standard: 4 credits for Outstanding**	4	4		4	Undertake energy workshop to focus on operation energy performance with design team and additional energy modelling during the design and post-construction stage to generate predicted operational energy consumption figures.
Ene 02	**Energy Monitoring**	Sub-Metering of End-Use Categories **Minimum Standard: 1 credit Very Good, Excellent and Outstanding**	1	1		4	Separate energy metering installed for each fuel type / use for 90% of estimated annual energy consumption, with pulsed output for future connection to energy management system.
		Sub-Metering of High Energy Load and Tenancy Areas	1	1		4	This requires sub metering of different functional areas. Meter to be connected to BMS or equipped with pulsed output for future connection to energy management system.
Ene 03	**External Lighting**	External Lighting	1	1		4	Average initial luminous efficacy of not less than 70 luminaire lumens per circuit Watt. Automatic control to prevent operation during daylight hours and presence detection in areas of intermittent pedestrian traffic.
Ene 04	**Low Carbon Design**	Passive Design Analysis	1	1		2	**Hea 04 to be achieved.** Analysis is carried out at RIBA Stage 2 and identifies passive design measures to reduce the total heating, cooling, mechanical ventilation, lighting loads and energy consumption.
		Free Cooling	1	0		4	Passive design is achieved and any of the free cooling strategies are implemented: night time cooling; ground coupled air cooling; displacement ventilation; ground water cooling; surface water cooling; evaporative cooling; desiccant dehumidification and evaporative cooling, using waste heat; absorption cooling, using waste heat; building does not require any significant form of active cooling or mech. ventilation i.e. naturally ventilated.
		Low Zero Carbon Feasibility Study	1	1		2	LZC Study carried out at RIBA Stage 2 by an energy specialist to establish most appropriate low or zero carbon energy source(s). Technology(is) to be specified and resulted in a meaningful reduction in regulated CO2 emissions.

Credit Ref.	Credit Title	Credit Name	Available	Targeted	Potential	RIBA Stage	Comments / Actions
TRANSPORT							
Tra 01	**Transport Assessment and Travel Plan**	Travel plan	2	2		2-4	Travel Plan and Transport Assessment to be carried out at early design stages cearly considering the impact onto the surrounding infrastructure and to calculate the public transport Accessibility Index (AI) for the assessed building. Preliminary calculations confirmed PTAL of 2.
Tra 02	**Sustainable Transport Measures**	1. The existing AI calculated in Tra 01	10	4	2	2-4	Credits are awarded based on identify the sustainable transport measures as per BREEAM manual Table 7.4 and on the AI of the site. Credit can be awarded when a minimum AI is 8. Preliminary calculations confirmed PTAL 2.
		2. Demonstrate an increase over the existing Accessibility Index.				2-4	Achieved through negotiation with local bus, train companies to increase the frequency of the local service or dedicated bus service, diverted bus route or new bus stop etc.
		3. Provide a public transport information system in a publicly accessible area, to allow building users access to up-to-date information on the available public transport and transport infrastructure.				2-4	This may include signposting to public transport, cycling, walking infrastructure or local amenities.
		4. Provide electric recharging stations of a minimum of 3kw for at least 10% of the total car parking capacity for the development.				2-4	Electric recharging stations of a minimum of 3kW for at least 10% of the total car park.
		5. Set up a car sharing group or facility to facilitate and encourage building users to car share. Raise awareness of the sharing scheme.				2-4	Car sharing group or facility, priority spaces for car sharers for at least 5% of the total car parking capacity, locate priority parking nearest the development.
		6. During preparation of the brief, the design team consults with the local authority (LA) on the state of the local cycling network and public accessible pedestrian routes, to focus on whichever the LA deems most relevant to the project, and how to improve it.				1	Agree and implement one proposition chosen with the local authority.
		7. Install compliant cycle storage spaces to meet the minimum levels set out in a BREEAM manual Table 7.5				2-4	Industrial: provide 1 cycling space for 10 staff.
		8. Provide at least two compliant cyclists' facilities for the building users, (including pupils where appropriate to the building type) – Showers; – Changing facilities; – Lockers; – Drying spaces.				2-4	Option 7 must be achieved in addition to at least 2 compliant cyclist facilities: showers, changing rooms, lockers or drying space.
		9. At least three existing accessible amenities are present within 500m of the main entrance.				2-4	Food outlet, ATM, access to an outdoor space, access to recreation/leisure facility, post office, community facility, GP surgery and child care. All depending on type of the buillding.
		10. Enhanced amenities				2-4	One or more of the new accessible amenity (as per point 9 above) is provided.
		11. Implement one site-specific improvement measure, not covered by the options already listed in this issue, in line with the recommendations of the travel plan.				2-4	Additional amenities as part of internal layout design to be agreed.
WATER							
Wat 01	**Water Consumption**	Water Consumption **Minimum Standard: 1 credit Good, Very Good, Excellent and 2 credis Outstanding**	5	3		4	Specification of water efficient domestic water-consuming components. Use the BREEAM Wat 01 calculator to assess the efficiency of sanitary wear.
Wat 02	**Water Monitoring**	Water Monitoring **Minimum Standard: Criterion 1 - water meter on mains Good, Very Good, Excellent and Outstanding**	1	1		4	Specification of water meter with pulsed output and BMS connected on mains water supply to each building. Install water sub-meters for all water consuming systems over 10% of the building demand.
Wat 03	**Water Leak Detection**	Leak Detection System	1	1		4	Water leak detection system with audible alarm capable of detecting a major leak on the mains water supply within the building and between the building and the utilities water meter.
		Flow Control Devices	1	1		4	Flow control devices that regulate the supply of water to each WC area/facility must be provided.

Credit Ref.	Credit Title	Credit Name	Available	Targeted	Potential	RIBA Stage	Comments / Actions
MATERIALS							
Mat 01	**Environmental Impacts from Construction Products - Building Life Cycle Assessment (LCA)**	Superstructure - Concept Design	6	4		2	Using BREEAM simplified Building LCA tool or an IMPACT approved tool, carry out building Life Cycle Assessment (LCA) at RIBA Stage 2 **before planning submission.** Integrate the LCA options appraisal within the wider design decision-making process.
		Superstructure - Technical Design				4	Using BREEAM simplified Building LCA tool or an IMPACT approved tool, carry out building LCA for superstructure design options at RIBA Stage 4.
		Substructure and Hard Landscaping Options Appraisal during Concept Design	1	1		2	Using BREEAM simplified Building LCA tool or an IMPACT approved tool, carry out the LCA options appraisal for s substructure and hard landscaping at RIBA Stage 2.
Mat 02	**Environmental Impacts from Construction Products - Environmental Product Declarations (EPD)**	Specification of Products with a Recognised Environmental Product Declaration (EPD)	1	0	1	4	To specify products with recognised EPD and use BREEAM Mat 01/02 results submission tool.
Mat 03	**Responsible Sourcing of Construction Products**	**Pre-requisite: Legal and sustainable timber**				4	**100% of timber and timber-based products used n the project are 'Legal' and 'Sustainable' as per UK Government's Timber Procurement Policy (TPP).**
		Enabling Sustainable Procurement	1	1		2	Sustainable Procurement Plan includes sustainability aims, objectives and strategic targets to guide procurement process must be in place before RIBA Stage 2.
		Measuring Responsible Sourcing	3	2		4	To specify materials from manufacturers who can provide EMS Certification, FSC, PEFC, SFI, CARES, Eco-reinforcement, BES 6001, Supply chain.
Mat 05	**Designing for Durability and Resilience**	Protecting Vulnerable Parts of the Building from Damage and Protecting Exposed Parts of the Building from Material Degradation	1		1	4	The building incorporates suitable durability and protection measures and specification to limit materials degradation between environmental factors.
Mat 06	**Material Efficiency**	Preparation and Brief	1	1	0	1	Set targets and report opportunities and methods for optimise the use of materials for each of the RIBA Stage. Consideration should be given to pre-fabrication and WRAP compliance.
		Concept Design				2	
		Developed Design				3	
		Technical Design				4	
		Construction				5	

Credit Ref.	Credit Title	Credit Name	Available	Targeted	Potential	RIBA Stage	Comments / Actions
WASTE							
Wst 01	**Construction Waste Management**	Pre-demolition Audit **Minimum Standard: 1 credit Outstanding**	1	1	0	2	Pre-demolition audit must be carried out at RIBA Stage 2 and include any existing building, structures and hard surfaces. Audit needs to be referenced in RMP below.
		Construction Resource Efficiency	3	2		4	Prepare a compliant Resource Management Plan (RMP) covering the targets of non-hazardous waste arising from site construction and main contractor to achieve a construction waste resource efficiency benchmark of 6.5 tonnes of construction waste generated per 100m2 GIA.
		Diversion of Resources from Landfill	1	1		4	Prepare a compliant RMP and divert at least 90% (tonnes) of demolition and 80% (tonnes) non-demolition waste from landfill.
Wst 02	**Recycled Aggregates**	**Pre-requisite: If demolition occurs on site, to encourage the reuse of the site-won material on site complaint Pre-demolition Audit**				4	**As per Wst 01 above.**
		Project Sustainable Aggregate Points	1	0	1	4	Identify all aggregate types, quantities and calculate the distance travelled by transport type. Points are awarded using BREEAM Wst 02 calculator.
Wst 03	**Operational Waste**	Operational Waste **Minimum Standard: 1 credit Excellent and Outstanding**	1	1		4	A dedicated central space for storage of recyclable waste, clearly labelled and accessible to building occupants/facilities operators. A minimum of $2m^2$ for each unit is required.
Wst 05	**Adaptation to Climate Change**	Resilience of structure, fabric, building services and renewables installation	1	1		2	Conduct a climate change adaptation strategy appraisal for structural and fabric resilience by the end of RIBA Stage 2. Carry out risk assessment to identify and evaluate the impact on the building from extreme weather conditions. Provide an update at RIBA Stage 4.
Wst 06	**Design for Disassembly and Adaptability**	Design for Disassembly and Functional Adaptability - Recommendations	1	1		2	Carry out and implement a functional adaptation appraisal at RIBA Stage 2 and developed recommendations and solutions (i.e. alternative building uses, functions, etc.)
		Disassembly and Functional Adaptability – Implementation	1	1		4	Provide an update during RIBA Stage 4, how the recommendations have been implemented i.e. plant replacement, horizontal / vertical expantion, refurbishment potential etc.

Credit Ref.	Credit Title	Credit Name	Available	Targeted	Potential	RIBA Stage	Comments / Actions
LAND USE & ECOLOGY							
LE 01	**Site Selection**	Previously Occupied Land	1	1		4	At lest 75% of new development footprint is built on the previously occupied land.
		Contaminated Land	1	0		4	Specialist's land contamination report and summary details of the implementation plan of the remediation strategy to be developed.
LE 02	**Ecological Risks and Opportunities**	**Pre-requisite: Statutory Obligations**				4	**The client or contractor confirms compliance is monitored against all relevant UK and EU or international legislation relating to the ecology of the site.**
		Survey and Evaluation	1	1		1	Route 2: SQE appointed to carry out survey and evaluation of the site.
		Determining Ecological Outcomes	1	1		2	The first credit achieved. Route 1 and 2 determining ecological outcomes, recommendations and data collection from survey. Evaluation is shared with design team to influence decision-making process.
LE 03	**Managing Impacts on Ecology**	**Prerequisite: Ecological Risks and Opportunities**				2	**LE 02 has been achieved. The client or contractor confirms compliance is monitored against all relevant UK and EU or international legislation relating to the ecology of the site.**
		Planning and Measures On-Site	1	1		2	Route 1 and 2: Roles and responsibilities to be assigned. Plan and implement site preparation and construction work early; collaborate and implement solutions and measures with stakeholders.
		Managing Negative Impacts	2	1		4	Route 1: Negative impacts from site preparation and construction works have been managed according to the hierarchy and no net impact has resulted (1 credit) Route 2: SQE to provide recommendation on avoidance of negative impact of the site preparation and construction works according to the hierarchy and no net impact has resulted (1 or 2 credits).
LE 04	**Ecological Change and Enhancement**	**Prerequisite: Managing Negative Impacts on Ecology**				2	**LE 03 has been achieved. Roles and responsibilities to be assigned. Site preparation and construction works have been planned. The client or contractor confirms compliance is monitored against all relevant UK and EU or international legislation relating to the ecology of the site.**
		Ecological Enhancement	1	1		4	Route 2: Project team liaise with stakeholders and implement solutions on site or off site within the zone of influence. (N/A for Route 1)
		Change and Enhancement of Ecology	3	2		4	Route 2: SQE to provide calculations of the change in ecological value (up to 3 credits)
LE 05	**Long Term Ecology Management and Maintenance**	**Prerequisite: Statutory Obligations, Planning and Site Implementation**				2	**LE 03 and LE 04 have been achieved. The client or contractor confirms compliance is monitored against all relevant UK and EU or international legislation relating to the ecology of the site.**
		Management and Maintenance throughout the Project	1	1		4	Route 1 and 2: The optimal ecological outcomes agreed in LE02 are are met in-practice and enhancement measures in LE03 & LE04 are implemented and monitored. A section on Ecology and Biodiversity has been included as part of the tenant or building owner information supplied.
		Landscape and Ecology Management Plan	1	1		4	Route 2: Landscape and ecology management plan, or similar, is developed in accordance with BS 42020:2013 covering as a minimum the first five years after project completion.

Credit Ref.	Credit Title	Credit Name	Available	Targeted	Potential	RIBA Stage	Comments / Actions
POLLUTION							
Pol 01	**Impact of Refrigerants**	**Pre-Requisite: Systems with Electric Compressors**				4	**All systems with electric compressors comply with the requirements of BS EN 378:2016 (parts 2 and 3). Refrigeration systems containing ammonia comply with the Institute of Refrigeration Ammonia Refrigeration Systems code of practice.**
		Impact of Refrigerants	2	1		4	1 credit where Refrigerant's Direct Effect Life Cycle CO_2 equivalent emissions (DELC CO_2e) of ≤ 1000 $kgCO_2e/kW$ cooling/heating capacity; 2 credits where DELC is ≤ 100 $kgCO_2e/kW$
		Leak Detection	1	0		4	All systems are hermetically sealed or only use environmentally benign refrigerants or a permanent automated refrigerant leak detection system is required.
Pol 02	**Local Air Quality**	**Is the project required to connect to a District Heating system, and it supplies all heating and hot water demands to the building?**				4	**When it is required to connect to DH the Local Air Quality credit is N/A.**
		Local Air Quality	2	2	0	4	Emissions from all installed combustion plant that provide space heating and domestic hot water do not exceed the gas boilers NOx = 24mg/kWh (2 credits) or 27mg/kWh (1 credit) or all electric.
Pol 03	**Flood and Surface Water Management**	Flood Resilience	2	2		4	Site specific Flood Risk Assessment prepared by specialist to confirm that if the site is a low, medium or high probability of flooding from all sources of flooding.
		Surface Water Run Off	2	1	1	4	**Surface water run-off design solutions must be bespoke.** Specialist to provide calculation and confirm the proposed attenuation measures, i.e. SUDs. Calculation for rate and volume of surface watr run-off.
		Minimising Watercourse Pollution	1	0	1	4	Specialist to confirm there is no discharge from the developed site for rainfall up to 5 mm and the pollution prevention systems are in line with the SUDs requirements.
Pol 04	**Reduction of Night Time Light Pollution**	Reduction of Night Time Light Pollution	1	1		4	External lighting design is in line with ILP guidance of obtrusive light and can be automatically switched off. Illuminated advertisements are designed in compliance with ILP PLG05 The Brightness of Illuminated Advertisements.
Pol 05	**Reduction of Noise Pollution**	Reduction of Noise Pollution	1	1		4	A BS 4142:2014 compliant noise impact assessment to be carried out by Acoustician.

Credit Ref.	Credit Title	Credit Name	Available	Targeted	Potential	RIBA Stage	Comments / Actions
EXEMPLARY							
Man 03	**Responsible Construction Practices**	Responsible Construction Practices	1	1		4	Principal contractor achieves score register the site under the Considerate Contractors Scheme (CCS) or Fleet Operator Recognition Scheme (FORS) and achieves score required for targeted credits.
Hea 01	**Visual Comfort**	Daylighting	1	0		4	When relevant building areas exceed good practice daylight factor OR the relevant building areas exceed good practice average and minimum point daylight illuminance criteria.
		Internal and External Lighting Levels, Zoning and Controls	1	0		4	Lighting in each zone can be manually dimmed down to 20%.
Hea 06	**Security**	Security of Site and Building	1	0		4	The performance against the scheme has been confirmed by independent assessment and verification.
Ene 01	**Reduction of Emissions**	Beyond Zero Net Rgulated Carbon and Carbon Negative	5	0		4	Carbon neutral or carbon negative building is achieved. A calculation of the energy score using the BREEAM Refurbishment and Fit-out energy model must be carried out. This must be assessed against a baseline BRUKL.
		Post Occupancy Stage	2	0		4	Achieve maximum available credits in Ene 02 and a client or building occupier commits funds to pay for the post occupancy stage. Assessor to be appointed and to report on the actual energy consumption for first 12 months. Remediation action might be required.
Wat 01	**Water Consumption**	Water Consumption	1	0		4	Specification of water efficient domestic water-consuming components to reduce the water consumption 65% beyond the baseline. Use the BREEAM Wat 01 calculator to assess the efficiency of sanitary wear including rainwater and greywater harvesting.
Mat 01	**Life Cycle Impacts**	Core Building Services Options Appraisal	1	1		4	Carry out LCA options of at least 3 signigicatly different core building services.
		LCA and LCC Alignment	1	0		4	Align LCA and LCC options appraisal activity. Both credits LCA and LCC must be achieved.
		Third Party Verification	1	0		4	A suitably qualified third party work or verifies the building LCA work and produces a report.
Mat 03	**Responsible Sourcing of Materials**	Responsible Sourcing of Construction Products	1	0		4	Achieve 50% of the points available in the Mat 03 calculation through sourcing of main building materials from responsible suppliers.
Wst 01	**Construction Waste Management**	Construction Resource Efficiency and Diversion of Resources from Landfill	1	0		4	To achieve a construction waste resource efficiency benchmark of 1.6m3 (or 1.9 tonnes) of construction waste generated per 100m2 GIA and divert at least 85% by volume or 90% tonnage of non-demolition waste from landfill and 85%y volume or 95% in tonnage of demolition waste from landfill.
Wst 02	**Recycled Aggregates**	Project Sustainable Aggregate Points	1	0		4	Identify all aggregate types, quantities and calculate the distance travelled by transport type. Points are awarded using BREEAM Wst 02 calculator.
Wst 05	**Adaptation to Climate Change**	Responding to Climate Change	1	0		4	Achieved when credits Hea 04 Thermal comfort, 8 credits in Ene 01, Ene 04 Passive analysis, 3 credits in Wat 01, Mat 05 Material degradatin and Pol 03 Flood risk and 2 credits for Surface water run-off credits are achieved.
LE 02	**Ecological Risks and Opportunities**	Wider Site Sustainability	1	0		4	Wider sustainability related activities and potential ecosystem service bnefits are considered as part of determining the optimal ecological outcomes for the site.

Appendix II

BRUKL Calculations

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name **Shell and Core**

Unit 1

As designed

Date: Wed Sep 16 09:30:35 2026

Administrative information

Building Details

Address: Manchester, M22 5PR

Certifier details

Name: Ciaran Dorrity

Telephone number: 02074860680

Address: 8-9 Stephen Mews, London, W1T 1AF

Certification tool

Calculation engine: EnergyPlus

Calculation engine version: "v9.4.0.002"

Interface to calculation engine: DesignBuilder DSM

Interface to calculation engine version: v7.3.1

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

Foundation area [m²]: 214.81

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

Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	1.8	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	-1.2	
Target primary energy rate (TPER), $kWh_{PE}/m^2.annum$	19.27	
Building primary energy rate (BPER), $kWh_{PE}/m^2.annum$	-16.96	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

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

Fabric element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.26	0.26	Unit 1 L00 Main Entrance - WC_W_6
Floors	0.18	0.18	0.18	Unit 1 L00 Main Entrance - Shower 1_E_0
Pitched roofs	0.16	0.16	0.16	Unit 1 Warehouse - Warehouse_R_2
Flat roofs	0.18	0.18	0.18	Unit 1 L00 Main Entrance - Circ 1_C_1
Windows** and roof windows	1.6	1.6	1.6	Unit 1 L00 Main Entrance - Lobby_G_2_1
Rooflights***	2.2	-	-	No Rooflights in project
Personnel doors^	1.6	1.38	1.6	Unit 1 L00 Main Entrance - Lobby_D_5
Vehicle access & similar large doors	1.3	1.3	1.3	Unit 1 Warehouse - Warehouse_D_12
High usage entrance doors	3	-	-	No external high usage entrance doors

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [W/(m²K)] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [W/(m²K)]

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [W/(m²K)]

* 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/m²K

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

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

Building services

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

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

1- Panel Heaters

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

2- Atlas Office VRF

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	4	6	-	1.4	0.85
Standard value	2.5*	N/A	N/A	2^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

1- Atlas DHW

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

Zone-level mechanical ventilation, exhaust, and terminal units

ID	**System type in the Approved Documents**
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	**SFP [W/(l/s)]**									**HR efficiency**	
ID of system type	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	**Zone**	**Standard**
Unit 1 L00 Main Entrance - Shower 1	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 1 L00 Main Entrance - WC	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 1 L00 Main Entrance - Shower	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 1 L00 Main Entrance - WC 1	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 1 L00 Main Entrance - Disabled WC	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 1 L01 Office - WC 3	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 1 L01 Office - WC	-	-	0.3	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
Unit 1 L01 Office - Disabled WC + shower 1	-		0.3	-	-	-	-	-	-	-	N/A
Unit 1 L01 Office - Shower	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 1 L02 Office - Disabled WC	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 1 L02 Office - WC 1	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 1 L02 Office - WC	-	-	0.3	-	-	-	-	-	-	-	N/A

Shell and core configuration

Zone	Assumed shell?
Unit 1 L00 Main Entrance - Shower 1	NO
Unit 1 L00 Main Entrance - WC	NO
Unit 1 L00 Main Entrance - Cleaners	NO
Unit 1 L00 Main Entrance - Circ 1	NO
Unit 1 L00 Main Entrance - Lobby	NO
Unit 1 L00 Main Entrance - Shower	NO
Unit 1 L00 Main Entrance - WC 1	NO
Unit 1 L00 Main Entrance - Circ	NO
Unit 1 L00 Main Entrance - Disabled WC	NO
Unit 1 L00 Main Entrance - Lift	NO
Unit 1 Undercroft - Cleaners	NO
Unit 1 Undercroft - Circ	NO
Unit 1 L01 Office - Cleaners	NO
Unit 1 L01 Office - Circ 1	NO
Unit 1 L01 Office - WC 3	NO
Unit 1 L01 Office - WC	NO
Unit 1 L01 Office - Sanitary Lobby	NO
Unit 1 L01 Office - L01 Circ	NO
Unit 1 L01 Office - Cleaners cupboard	NO
Unit 1 L01 Office - Lift	NO
Unit 1 L01 Office - Disabled WC + shower 1	NO
Unit 1 L01 Office - Shower	NO
Unit 1 L01 Office - Office	NO
Unit 1 L02 Office - Store TBC	NO
Unit 1 L02 Office - Circ 1	NO
Unit 1 L02 Office - Lift	NO
Unit 1 L02 Office - Circ 2	NO
Unit 1 L02 Office - Circ	NO
Unit 1 L02 Office - Disabled WC	NO
Unit 1 L02 Office - WC 1	NO
Unit 1 L02 Office - WC	NO
Unit 1 L02 Office - Store	NO
Unit 1 L02 Office - Cleaners	NO
Unit 1 L02 Office - L02 Office	NO
Unit 1 Warehouse - Warehouse	NO

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
Unit 1 L00 Main Entrance - Shower 1	110	-	-
Unit 1 L00 Main Entrance - WC	110	-	-
Unit 1 L00 Main Entrance - Cleaners	110	-	-
Unit 1 L00 Main Entrance - Circ 1	110	-	-
Unit 1 L00 Main Entrance - Lobby	110	-	-
Unit 1 L00 Main Entrance - Shower	110	-	-
Unit 1 L00 Main Entrance - WC 1	110	-	-
Unit 1 L00 Main Entrance - Circ	110	-	-
Unit 1 L00 Main Entrance - Disabled WC	110	-	-
Unit 1 L00 Main Entrance - Lift	110	-	-
Unit 1 Undercroft - Cleaners	110	-	-
Unit 1 Undercroft - Circ	110	-	-
Unit 1 L01 Office - Cleaners	110	-	-
Unit 1 L01 Office - Circ 1	110	-	-
Unit 1 L01 Office - WC 3	110	-	-
Unit 1 L01 Office - WC	110	-	-
Unit 1 L01 Office - Sanitary Lobby	110	-	-
Unit 1 L01 Office - L01 Circ	110	-	-
Unit 1 L01 Office - Cleaners cupboard	110	-	-
Unit 1 L01 Office - Lift	110	-	-
Unit 1 L01 Office - Disabled WC + shower 1	110	-	-
Unit 1 L01 Office - Shower	110	-	-
Unit 1 L01 Office - Office	110	-	-
Unit 1 L02 Office - Store TBC	110	-	-
Unit 1 L02 Office - Circ 1	110	-	-
Unit 1 L02 Office - Lift	110	-	-
Unit 1 L02 Office - Circ 2	110	-	-
Unit 1 L02 Office - Circ	110	-	-
Unit 1 L02 Office - Disabled WC	110	-	-
Unit 1 L02 Office - WC 1	110	-	-
Unit 1 L02 Office - WC	110	-	-
Unit 1 L02 Office - Store	110	-	-
Unit 1 L02 Office - Cleaners	110	-	-
Unit 1 L02 Office - L02 Office	110	-	-
Unit 1 Warehouse - Warehouse	150	-	-

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

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Unit 1 L00 Main Entrance - Lobby	NO (-6.7%)	NO
Unit 1 L01 Office - Office	NO (-27%)	NO
Unit 1 L02 Office - L02 Office	NO (-27.1%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Unit 1 Warehouse - Warehouse	NO (-6.2%)	NO

Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	NO
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	NO

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m^2]	8662.8	8662.8
External area [m^2]	24400.4	24400.4
Weather	MAN	MAN
Infiltration [m^3/hm^2@ 50Pa]	5	5
Average conductance [W/K]	6344.13	20245.9
Average U-value [W/m^2K]	0.26	0.83
Alpha value* [%]	25	10

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

Building Use

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

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

	Actual	Notional
Heating	1.64	0.94
Cooling	0.46	0.19
Auxiliary	0.73	1.18
Lighting	5.6	4.44
Hot water	7.25	7.25
Equipment*	30.81	30.81
TOTAL**	**15.67**	**13.99**

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

Energy Production by Technology [kWh/m^2]

	Actual	Notional
Photovoltaic systems	28.38	0.95
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*28.38*	*0.95*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	13.06	7.22
Primary energy [kWh_{PE}/m^2]	-16.96	19.27
Total emissions [kg/m^2]	-1.17	1.78

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] No Heating or Cooling										
	Actual	0	0	0	0	0.2	0	0	0	0
	Notional	0	0	0	0	0.4	0	0	----	----
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
	Actual	304.5	0	105.7	0	0	0.8	0	1	0
	Notional	268.9	0	55.7	0	0	1.34	0	----	----
[ST] Variable refrigerant flow, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	43.1	103.6	3.2	7.5	9.1	3.69	3.83	4	6
	Notional	27.6	30.8	2.9	3.2	13.6	2.64	2.7	----	----

Key to terms

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

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name **Shell and Core**

Unit 4

As designed

Date: Wed Sep 16 09:36:21 2026

Administrative information

Building Details

Address: Manchester, M22 5PR

Certifier details

Name: Ciaran Dorrity

Telephone number: 02074860680

Address: 8-9 Stephen Mews, London, W1T 1AF

Certification tool

Calculation engine: EnergyPlus

Calculation engine version: "v9.4.0.002"

Interface to calculation engine: DesignBuilder DSM

Interface to calculation engine version: v7.3.1

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

Foundation area [m²]: 142.89

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

Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	2.7	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	0.7	
Target primary energy rate (TPER), $kWh_{PE}/m^2.annum$	29.36	
Building primary energy rate (BPER), $kWh_{PE}/m^2.annum$	4	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

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

Fabric element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.26	0.26	Unit 4 GF - WC_2_W_2
Floors	0.18	0.18	0.18	Unit 4 GF - WC_2_E_0
Pitched roofs	0.16	0.16	0.16	Unit 4 Warehouse - Warehouse_R_4
Flat roofs	0.18	0.18	0.18	Unit 4 GF - Void_C_1
Windows** and roof windows	1.6	1.6	1.6	Unit 4 GF - Circ_G_2_1
Rooflights***	2.2	-	-	No Rooflights in project
Personnel doors^	1.6	1.4	1.6	Unit 4 GF - Cir_D_0
Vehicle access & similar large doors	1.3	1.3	1.3	Unit 4 Warehouse - Warehouse_D_0
High usage entrance doors	3	-	-	No external high usage entrance doors

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [W/(m²K)] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [W/(m²K)]

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [W/(m²K)]

* 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/m²K

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

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

Building services

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

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

1- Panel Heaters

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

2- Atlas Office VRF

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	4	6	-	1.4	0.85
Standard value	2.5*	N/A	N/A	2^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

1- Atlas DHW

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

Zone-level mechanical ventilation, exhaust, and terminal units

ID	**System type in the Approved Documents**
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	**SFP [W/(l/s)]**									**HR efficiency**	
ID of system type	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	**Zone**	**Standard**
Unit 4 GF - WC 2	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 4 GF - Disabled WC	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 4 GF - Shower	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 4 GF - WC	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 4 GF - Shower 2	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 4 GF - Shower 1	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 4 L01 - WC 1	-	-	0.3	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
Unit 4 L01 - Shower 1	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 4 L01 - WC	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 4 L01 - Shower 2	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 4 L01 - Disabled WC	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 4 L01 - Shower	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 4 L01 - Kitchenette	-	-	0.3	-	-	-	-	-	-	-	N/A

Shell and core configuration

Zone	Assumed shell?
Unit 4 GF - WC 2	NO
Unit 4 GF - Circ	NO
Unit 4 GF - Circ 1	NO
Unit 4 GF - Disabled WC	NO
Unit 4 GF - Shower	NO
Unit 4 GF - Cleaners	NO
Unit 4 GF - Lift	NO
Unit 4 GF - WC	NO
Unit 4 GF - Shower 2	NO
Unit 4 GF - Shower 1	NO
Unit 4 GF - Store	NO
Unit 4 GF - Cir	NO
Unit 4 GF - Lobby	NO
Unit 4 L01 - Store	NO
Unit 4 L01 - Circ 2	NO
Unit 4 L01 - WC 1	NO
Unit 4 L01 - Shower 1	NO
Unit 4 L01 - WC	NO
Unit 4 L01 - Circ 1	NO
Unit 4 L01 - Shower 2	NO
Unit 4 L01 - Disabled WC	NO
Unit 4 L01 - Shower	NO
Unit 4 L01 - Lift	NO
Unit 4 L01 - Cleaners	NO
Unit 4 L01 - Circ 3	NO
Unit 4 L01 - Kitchenette	NO
Unit 4 L01 - Circ 4	NO
Unit 4 L01 - Circ 5	NO
Unit 4 L01 - Office 1	NO
Unit 4 L01 - Office	NO
Unit 4 Warehouse - Warehouse	NO

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
Unit 4 GF - WC 2	110	-	-

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
Unit 4 GF - Circ	110	-	-
Unit 4 GF - Circ 1	110	-	-
Unit 4 GF - Disabled WC	110	-	-
Unit 4 GF - Shower	110	-	-
Unit 4 GF - Cleaners	110	-	-
Unit 4 GF - Lift	110	-	-
Unit 4 GF - WC	110	-	-
Unit 4 GF - Shower 2	110	-	-
Unit 4 GF - Shower 1	110	-	-
Unit 4 GF - Store	110	-	-
Unit 4 GF - Cir	110	-	-
Unit 4 GF - Lobby	110	-	-
Unit 4 L01 - Store	110	-	-
Unit 4 L01 - Circ 2	110	-	-
Unit 4 L01 - WC 1	110	-	-
Unit 4 L01 - Shower 1	110	-	-
Unit 4 L01 - WC	110	-	-
Unit 4 L01 - Circ 1	110	-	-
Unit 4 L01 - Shower 2	110	-	-
Unit 4 L01 - Disabled WC	110	-	-
Unit 4 L01 - Shower	110	-	-
Unit 4 L01 - Lift	110	-	-
Unit 4 L01 - Cleaners	110	-	-
Unit 4 L01 - Circ 3	110	-	-
Unit 4 L01 - Kitchenette	110	-	-
Unit 4 L01 - Circ 4	110	-	-
Unit 4 L01 - Circ 5	110	-	-
Unit 4 L01 - Office 1	110	-	-
Unit 4 L01 - Office	110	-	-
Unit 4 Warehouse - Warehouse	150	-	-

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

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Unit 4 GF - Lobby	YES (+30.5%)	NO
Unit 4 L01 - Office 1	NO (-50.7%)	NO
Unit 4 L01 - Office	YES (+17.5%)	NO
Unit 4 Warehouse - Warehouse	YES (+8.4%)	NO

Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	NO
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	NO

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m^2]	5639.1	5639.1
External area [m^2]	16664.3	16664.3
Weather	MAN	MAN
Infiltration [m^3/hm^2@ 50Pa]	5	5
Average conductance [W/K]	4540.05	13157.9
Average U-value [W/m^2K]	0.27	0.79
Alpha value* [%]	25	10

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

Building Use

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

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

	Actual	Notional
Heating	2.94	1.67
Cooling	0.36	0.15
Auxiliary	0.65	1.12
Lighting	5.41	4.46
Hot water	13.59	13.59
Equipment*	30.54	30.54
TOTAL**	**22.95**	**20.99**

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

Energy Production by Technology [kWh/m^2]

	Actual	Notional
Photovoltaic systems	21.44	1.12
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*21.44*	*1.12*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	16.01	10.8
Primary energy [kWh_{PE}/m^2]	4	29.36
Total emissions [kg/m^2]	0.66	2.71

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] No Heating or Cooling										
	Actual	0	0	0	0	0.2	0	0	0	0
	Notional	0	0	0	0	0.4	0	0	----	----
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
	Actual	313.2	0	108.7	0	0	0.8	0	1	0
	Notional	271.2	0	56.2	0	0	1.34	0	----	----
[ST] Variable refrigerant flow, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	63.6	97.5	4.8	7.1	8.9	3.69	3.83	4	6
	Notional	51.8	27.9	5.4	2.9	14.5	2.64	2.7	----	----

Key to terms

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

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name **Shell and Core**

Unit 5

As designed

Date: Wed Sep 16 09:38:48 2026

Administrative information

Building Details

Address: Manchester, M22 5PR

Certifier details

Name: Ciaran Dorrity

Telephone number: 02074860680

Address: 8-9 Stephen Mews, London, W1T 1AF

Certification tool

Calculation engine: EnergyPlus

Calculation engine version: "v9.4.0.002"

Interface to calculation engine: DesignBuilder DSM

Interface to calculation engine version: v7.3.1

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

Foundation area [m²]: 137.33

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

Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	2.9	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	1.7	
Target primary energy rate (TPER), $kWh_{PE}/m^2.annum$	31.77	
Building primary energy rate (BPER), $kWh_{PE}/m^2.annum$	16.11	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

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

Fabric element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.26	0.26	Unit 5 GF - WC_1_W_5
Floors	0.18	0.18	0.18	Unit 5 GF - Shower_1_E_0
Pitched roofs	0.16	0.16	0.16	Unit 5 - Warehouse_R_0
Flat roofs	0.18	0.18	0.18	Unit 5 GF - Void_C_1
Windows** and roof windows	1.6	1.6	1.6	Unit 5 GF - Circ_2_G_7_1
Rooflights***	2.2	-	-	No Rooflights in project
Personnel doors^	1.6	1.48	1.6	Unit 5 GF - Lobby_D_7
Vehicle access & similar large doors	1.3	1.3	1.3	Unit 5 - Warehouse_D_0
High usage entrance doors	3	-	-	No external high usage entrance doors

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [W/(m²K)] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [W/(m²K)]

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [W/(m²K)]

* 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/m²K

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

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

Building services

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

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

1- Panel Heaters

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

2- Atlas Office VRF

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	4	6	-	1.4	0.85
Standard value	2.5*	N/A	N/A	2^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

1- Atlas DHW

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

Zone-level mechanical ventilation, exhaust, and terminal units

ID	**System type in the Approved Documents**
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	**SFP [W/(l/s)]**									**HR efficiency**	
ID of system type	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	**Zone**	**Standard**
Unit 5 GF - Shower 1	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 5 GF - WC 1	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 5 GF - WC	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 5 GF - Shower 2	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 5 GF - Shower	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 5 GF - Disabled WC	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 5 L01 - WC 1	-	-	0.3	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
Unit 5 L01 - Kitchenette	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 5 L01 - Shower 1	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 5 L01 - WC 2	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 5 L01 - WC	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 5 L01 - Shower 2	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 5 L01 - Shower	-	-	0.3	-	-	-	-	-	-	-	N/A

Shell and core configuration

Zone	Assumed shell?
Unit 5 GF - Shower 1	NO
Unit 5 GF - WC 1	NO
Unit 5 GF - WC	NO
Unit 5 GF - Shower 2	NO
Unit 5 GF - Circ 1	NO
Unit 5 GF - Lift	NO
Unit 5 GF - Cleaners	NO
Unit 5 GF - Shower	NO
Unit 5 GF - Disabled WC	NO
Unit 5 GF - Circ 2	NO
Unit 5 GF - Lobby	NO
Unit 5 GF - Store	NO
Unit 5 GF - Circ	NO
Unit 5 L01 - Circ 1	NO
Unit 5 L01 - Store	NO
Unit 5 L01 - Office 1	NO
Unit 5 L01 - WC 1	NO
Unit 5 L01 - Cleaners	NO
Unit 5 L01 - Kitchenette	NO
Unit 5 L01 - Office	NO
Unit 5 L01 - Circ 2	NO
Unit 5 L01 - Circ 4	NO
Unit 5 L01 - Circ 3	NO
Unit 5 L01 - Shower 1	NO
Unit 5 L01 - WC 2	NO
Unit 5 L01 - Lift	NO
Unit 5 L01 - Circ	NO
Unit 5 L01 - WC	NO
Unit 5 L01 - Shower 2	NO
Unit 5 L01 - Shower	NO
Unit 5 - Warehouse	NO

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
Unit 5 GF - Shower 1	110	-	-

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
Unit 5 GF - WC 1	110	-	-
Unit 5 GF - WC	110	-	-
Unit 5 GF - Shower 2	110	-	-
Unit 5 GF - Circ 1	110	-	-
Unit 5 GF - Lift	110	-	-
Unit 5 GF - Cleaners	110	-	-
Unit 5 GF - Shower	110	-	-
Unit 5 GF - Disabled WC	110	-	-
Unit 5 GF - Circ 2	110	-	-
Unit 5 GF - Lobby	110	-	-
Unit 5 GF - Store	110	-	-
Unit 5 GF - Circ	110	-	-
Unit 5 L01 - Circ 1	110	-	-
Unit 5 L01 - Store	110	-	-
Unit 5 L01 - Office 1	110	-	-
Unit 5 L01 - WC 1	110	-	-
Unit 5 L01 - Cleaners	110	-	-
Unit 5 L01 - Kitchenette	110	-	-
Unit 5 L01 - Office	110	-	-
Unit 5 L01 - Circ 2	110	-	-
Unit 5 L01 - Circ 4	110	-	-
Unit 5 L01 - Circ 3	110	-	-
Unit 5 L01 - Shower 1	110	-	-
Unit 5 L01 - WC 2	110	-	-
Unit 5 L01 - Lift	110	-	-
Unit 5 L01 - Circ	110	-	-
Unit 5 L01 - WC	110	-	-
Unit 5 L01 - Shower 2	110	-	-
Unit 5 L01 - Shower	110	-	-
Unit 5 - Warehouse	150	-	-

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

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Unit 5 GF - Lobby	YES (+1.8%)	NO
Unit 5 L01 - Office 1	YES (+11.7%)	NO
Unit 5 L01 - Office	NO (-53%)	NO
Unit 5 - Warehouse	NO (-2.3%)	NO

Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	NO
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	NO

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m^2]	4935.6	4935.6
External area [m^2]	14593.1	14593.1
Weather	MAN	MAN
Infiltration [m^3/hm^2@ 50Pa]	5	5
Average conductance [W/K]	3844.45	11251.6
Average U-value [W/m^2K]	0.26	0.77
Alpha value* [%]	25	10

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

Building Use

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

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

	Actual	Notional
Heating	3.18	1.96
Cooling	0.37	0.16
Auxiliary	0.75	1.32
Lighting	5.58	4.62
Hot water	14.63	14.63
Equipment*	30.69	30.69
TOTAL**	**24.5**	**22.68**

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

Energy Production by Technology [kWh/m^2]

	Actual	Notional
Photovoltaic systems	14.63	1.18
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*14.63*	*1.18*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	17.29	12.62
Primary energy [kWh_{PE}/m^2]	16.11	31.77
Total emissions [kg/m^2]	1.68	2.93

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] No Heating or Cooling										
	Actual	0	0	0	0	0.3	0	0	0	0
	Notional	0	0	0	0	0.5	0	0	----	----
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
	Actual	325.3	0	113	0	0	0.8	0	1	0
	Notional	305.3	0	63.3	0	0	1.34	0	----	----
[ST] Variable refrigerant flow, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	67	88	5	6.4	8.9	3.69	3.83	4	6
	Notional	55.9	27.4	5.9	2.8	14.7	2.64	2.7	----	----

Key to terms

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

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name **Shell and Core**

Unit 6

As designed

Date: Tue Sep 15 12:17:30 2026

Administrative information

Building Details

Address: Manchester, M22 5PR

Certifier details

Name: Ciaran Dorrity

Telephone number: 02074860680

Address: 8-9 Stephen Mews, London, W1T 1AF

Certification tool

Calculation engine: EnergyPlus

Calculation engine version: "v9.4.0.002"

Interface to calculation engine: DesignBuilder DSM

Interface to calculation engine version: v7.3.1

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

Foundation area [m²]: 226.65

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

Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	1.8	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	-1.3	
Target primary energy rate (TPER), $kWh_{PE}/m^2.annum$	19.8	
Building primary energy rate (BPER), $kWh_{PE}/m^2.annum$	-18.23	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

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

Fabric element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.26	0.26	Unit 6 Office GF - WC 1_W_2
Floors	0.18	0.18	0.18	Unit 6 Office GF - Shower 1_E_0
Pitched roofs	0.16	0.16	0.18	Unit 6 Warehouse - Warehouse_R_5
Flat roofs	0.18	0.18	0.18	Unit 6 Office GF - Void_C_1
Windows** and roof windows	1.6	1.6	1.6	Unit 6 Office GF - Lobby_G_2_1
Rooflights***	2.2	-	-	No Rooflights in project
Personnel doors^	1.6	1.39	1.6	Unit 6 Office GF - Lobby_D_2
Vehicle access & similar large doors	1.3	1.3	1.3	Unit 6 Warehouse - Warehouse_D_9
High usage entrance doors	3	-	-	No external high usage entrance doors

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [W/(m²K)] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [W/(m²K)]

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [W/(m²K)]

* 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/m²K

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

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

Building services

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

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

1- Panel Heaters

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

2- Atlas Office VRF

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	4	6	-	1.4	0.85
Standard value	2.5*	N/A	N/A	2^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

1- Atlas DHW

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

Zone-level mechanical ventilation, exhaust, and terminal units

ID	**System type in the Approved Documents**
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	**SFP [W/(l/s)]**									**HR efficiency**	
ID of system type	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	**Zone**	**Standard**
Unit 6 Office GF - Shower 1	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 6 Office GF - WC 1	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 6 Office GF - Shower	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 6 Office GF - WC 2	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 6 Office GF - WC	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 6 Office L01 - Disabled WC	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 6 Office L01 - WC 2	-	-	0.3	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
Unit 6 Office L01 - WC 3	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 6 L02 - WC 1	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 6 L02 - WC 2	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 6 L02 - WC	-	-	0.3	-	-	-	-	-	-	-	N/A

Shell and core configuration

Zone	Assumed shell?
Unit 6 Office GF - Shower 1	NO
Unit 6 Office GF - WC 1	NO
Unit 6 Office GF - Circ 1	NO
Unit 6 Office GF - Lobby	NO
Unit 6 Office GF - Shower	NO
Unit 6 Office GF - WC 2	NO
Unit 6 Office GF - Cleaners 1	NO
Unit 6 Office GF - WC	NO
Unit 6 Office GF - Lift	NO
Unit 6 Office GF - Cleaners	NO
Unit 6 Office GF - Circ	NO
Unit 6 Office L01 - Cleaners 1	NO
Unit 6 Office L01 - Circ 1	NO
Unit 6 Office L01 - Disabled WC	NO
Unit 6 Office L01 - Circ 2	NO
Unit 6 Office L01 - Circ	NO
Unit 6 Office L01 - Lift	NO
Unit 6 Office L01 - WC 2	NO
Unit 6 Office L01 - WC 3	NO
Unit 6 Office L01 - Cleaners	NO
Unit 6 Office L01 - Office	NO
Unit 6 L02 - WC 1	NO
Unit 6 L02 - Cleaners	NO
Unit 6 L02 - Circ 3	NO
Unit 6 L02 - Circ 1	NO
Unit 6 L02 - WC 2	NO
Unit 6 L02 - Store 1	NO
Unit 6 L02 - WC	NO
Unit 6 L02 - Lift	NO
Unit 6 L02 - Store	NO
Unit 6 L02 - Circ	NO
Unit 6 L02 - Office	NO
Unit 6 Warehouse - Warehouse	NO

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
Unit 6 Office GF - Shower 1	110	-	-

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
Unit 6 Office GF - WC 1	110	-	-
Unit 6 Office GF - Circ 1	110	-	-
Unit 6 Office GF - Lobby	110	-	-
Unit 6 Office GF - Shower	110	-	-
Unit 6 Office GF - WC 2	110	-	-
Unit 6 Office GF - Cleaners 1	110	-	-
Unit 6 Office GF - WC	110	-	-
Unit 6 Office GF - Lift	110	-	-
Unit 6 Office GF - Cleaners	110	-	-
Unit 6 Office GF - Circ	110	-	-
Unit 6 Office L01 - Cleaners 1	110	-	-
Unit 6 Office L01 - Circ 1	110	-	-
Unit 6 Office L01 - Disabled WC	110	-	-
Unit 6 Office L01 - Circ 2	110	-	-
Unit 6 Office L01 - Circ	110	-	-
Unit 6 Office L01 - Lift	110	-	-
Unit 6 Office L01 - WC 2	110	-	-
Unit 6 Office L01 - WC 3	110	-	-
Unit 6 Office L01 - Cleaners	110	-	-
Unit 6 Office L01 - Office	110	-	-
Unit 6 L02 - WC 1	110	-	-
Unit 6 L02 - Cleaners	110	-	-
Unit 6 L02 - Circ 3	110	-	-
Unit 6 L02 - Circ 1	110	-	-
Unit 6 L02 - WC 2	110	-	-
Unit 6 L02 - Store 1	110	-	-
Unit 6 L02 - WC	110	-	-
Unit 6 L02 - Lift	110	-	-
Unit 6 L02 - Store	110	-	-
Unit 6 L02 - Circ	110	-	-
Unit 6 L02 - Office	110	-	-
Unit 6 Warehouse - Warehouse	150	-	-

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

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Unit 6 Office GF - Lobby	YES (+48.9%)	NO
Unit 6 Office L01 - Office	YES (+7.4%)	NO
Unit 6 L02 - Office	YES (+8.5%)	NO
Unit 6 Warehouse - Warehouse	YES (+1%)	NO

Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	NO
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	NO

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m^2]	7033.6	7033.6
External area [m^2]	20066.4	20066.4
Weather	MAN	MAN
Infiltration [m^3/hm^2@ 50Pa]	5	5
Average conductance [W/K]	5357.65	16171.3
Average U-value [W/m^2K]	0.27	0.81
Alpha value* [%]	25	10

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

Building Use

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

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

	Actual	Notional
Heating	2.52	1.48
Cooling	0.69	0.31
Auxiliary	0.88	1.55
Lighting	5.62	4.58
Hot water	6.83	6.83
Equipment*	30.96	30.96
TOTAL**	**16.54**	**14.74**

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

Energy Production by Technology [kWh/m^2]

	Actual	Notional
Photovoltaic systems	30.18	1.36
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*30.18*	*1.36*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	19.15	11.07
Primary energy [kWh_{PE}/m^2]	-18.23	19.8
Total emissions [kg/m^2]	-1.26	1.84

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] No Heating or Cooling										
	Actual	0	0	0	0	0.2	0	0	0	0
	Notional	0	0	0	0	0.5	0	0	----	----
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
	Actual	295	0	102.4	0	0	0.8	0	1	0
	Notional	276.7	0	57.4	0	0	1.34	0	----	----
[ST] Variable refrigerant flow, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	41.5	127.5	3.1	9.2	9.1	3.69	3.83	4	6
	Notional	25.1	40.7	2.6	4.2	15.3	2.64	2.7	----	----

Key to terms

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

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name **Shell and Core**

Unit 7

As designed

Date: Wed Sep 16 09:47:47 2026

Administrative information

Building Details

Address: Manchester, M22 5PR

Certifier details

Name: Ciaran Dorrity

Telephone number: 02074860680

Address: 8-9 Stephen Mews, London, W1T 1AF

Certification tool

Calculation engine: EnergyPlus

Calculation engine version: "v9.4.0.002"

Interface to calculation engine: DesignBuilder DSM

Interface to calculation engine version: v7.3.1

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

Foundation area [m²]: 226.54

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

Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	2	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	-0.7	
Target primary energy rate (TPER), $kWh_{PE}/m^2.annum$	21.73	
Building primary energy rate (BPER), $kWh_{PE}/m^2.annum$	-11.49	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

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

Fabric element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.26	0.26	Unit 7 GF - WC 1_W_8
Floors	0.18	0.18	0.18	Unit 7 GF - WC 1_E_0
Pitched roofs	0.16	0.17	0.18	Unit 7 - Warehouse_R_8
Flat roofs	0.18	0.16	0.18	Unit 7 GF - Circ 2_C_1
Windows** and roof windows	1.6	1.6	1.6	Unit 7 GF - Entrance_G_2_1
Rooflights***	2.2	-	-	No Rooflights in project
Personnel doors^	1.6	1.46	1.6	Unit 7 GF - Entrance_D_3
Vehicle access & similar large doors	1.3	1.3	1.3	Unit 7 - Warehouse_D_0
High usage entrance doors	3	-	-	No external high usage entrance doors

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [W/(m²K)] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [W/(m²K)]

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [W/(m²K)]

* 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/m²K

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

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

Building services

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

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

1- Panel Heaters

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

2- Atlas Office VRF

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	4	6	-	1.4	0.85
Standard value	2.5*	N/A	N/A	2^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

1- Atlas DHW

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

Zone-level mechanical ventilation, exhaust, and terminal units

ID	**System type in the Approved Documents**
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	**SFP [W/(l/s)]**									**HR efficiency**	
ID of system type	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	**Zone**	**Standard**
Unit 7 GF - WC 1	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 7 GF - Shower 1	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 7 GF - Shower	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 7 GF - WC 2	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 7 GF - WC	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 7 Office L01 - WC 1	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 7 Office L01 - WC 2	-	-	0.3	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
Unit 7 Office L01 - WC	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 7 Office L02 - WC 2	-	-	0.3	-	-	-	-	-	-	-	N/A

Shell and core configuration

Zone	Assumed shell?
Unit 7 GF - WC 1	NO
Unit 7 GF - Cleaners	NO
Unit 7 GF - Circ 2	NO
Unit 7 GF - Entrance	NO
Unit 7 GF - Shower 1	NO
Unit 7 GF - Shower	NO
Unit 7 GF - WC 2	NO
Unit 7 GF - WC	NO
Unit 7 GF - Store	NO
Unit 7 GF - Circ 1	NO
Unit 7 GF - Lift	NO
Unit 7 Office L01 - WC 1	NO
Unit 7 Office L01 - Circ 1	NO
Unit 7 Office L01 - Circ 2	NO
Unit 7 Office L01 - Lift	NO
Unit 7 Office L01 - WC 2	NO
Unit 7 Office L01 - WC	NO
Unit 7 Office L01 - Store	NO
Unit 7 Office L01 - Circ	NO
Unit 7 Office L01 - Cleaners	NO
Unit 7 Office L01 - Office	NO
Unit 7 Office L02 - Cleaners	NO
Unit 7 Office L02 - Circ 1	NO
Unit 7 Office L02 - WC 2	NO
Unit 7 Office L02 - Lift	NO
Unit 7 Office L02 - Store	NO
Unit 7 Office L02 - Circ	NO
Unit 7 Office L02 - Office	NO
Unit 7 - Warehouse	NO

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
Unit 7 GF - WC 1	110	-	-
Unit 7 GF - Cleaners	110	-	-
Unit 7 GF - Circ 2	110	-	-
Unit 7 GF - Entrance	110	-	-
Unit 7 GF - Shower 1	110	-	-

General lighting and display lighting	General luminaire	Display light source	
Zone name	**Efficacy [lm/W]**	**Efficacy [lm/W]**	**Power density [W/m²]**
Standard value	95	80	0.3
Unit 7 GF - Shower	110	-	-
Unit 7 GF - WC 2	110	-	-
Unit 7 GF - WC	110	-	-
Unit 7 GF - Store	110	-	-
Unit 7 GF - Circ 1	110	-	-
Unit 7 GF - Lift	110	-	-
Unit 7 Office L01 - WC 1	110	-	-
Unit 7 Office L01 - Circ 1	110	-	-
Unit 7 Office L01 - Circ 2	110	-	-
Unit 7 Office L01 - Lift	110	-	-
Unit 7 Office L01 - WC 2	110	-	-
Unit 7 Office L01 - WC	110	-	-
Unit 7 Office L01 - Store	110	-	-
Unit 7 Office L01 - Circ	110	-	-
Unit 7 Office L01 - Cleaners	110	-	-
Unit 7 Office L01 - Office	110	-	-
Unit 7 Office L02 - Cleaners	110	-	-
Unit 7 Office L02 - Circ 1	110	-	-
Unit 7 Office L02 - WC 2	110	-	-
Unit 7 Office L02 - Lift	110	-	-
Unit 7 Office L02 - Store	110	-	-
Unit 7 Office L02 - Circ	110	-	-
Unit 7 Office L02 - Office	110	-	-
Unit 7 - Warehouse	150	-	-

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

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Unit 7 Office L01 - Office	YES (+11.7%)	NO
Unit 7 Office L02 - Office	NO (-50%)	NO
Unit 7 - Warehouse	YES (+6%)	NO

Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	NO
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	NO

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m^2]	5867.3	5867.3
External area [m^2]	16693.9	16693.9
Weather	MAN	MAN
Infiltration [m^3/hm^2@ 50Pa]	5	5
Average conductance [W/K]	4639.67	13882.1
Average U-value [W/m^2K]	0.28	0.83
Alpha value* [%]	25	10

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

Building Use

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

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

	Actual	Notional
Heating	4.53	2.34
Cooling	0.77	0.42
Auxiliary	0.95	1.75
Lighting	5.86	4.85
Hot water	7.35	7.35
Equipment*	31.19	31.19
TOTAL**	**19.47**	**16.72**

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

Energy Production by Technology [kWh/m^2]

	Actual	Notional
Photovoltaic systems	28.58	2.05
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*28.58*	*2.05*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	25.26	16.05
Primary energy [kWh_{PE}/m^2]	-11.49	21.73
Total emissions [kg/m^2]	-0.67	2.02

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] No Heating or Cooling										
	Actual	0	0	0	0	0.2	0	0	0	0
	Notional	0	0	0	0	0.4	0	0	----	----
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
	Actual	367.6	0	127.6	0	0	0.8	0	1	0
	Notional	306.8	0	63.6	0	0	1.34	0	----	----
[ST] Variable refrigerant flow, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	24.3	130.8	1.8	9.5	9.3	3.69	3.83	4	6
	Notional	17.6	50.1	1.9	5.2	16.9	2.64	2.7	----	----

Key to terms

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

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name **Shell and Core**

Units 2-3

As designed

Date: Wed Sep 16 09:41:59 2026

Administrative information

Building Details

Address: Manchester, M22 5PR

Certification tool

Calculation engine: EnergyPlus

Calculation engine version: "v9.4.0.002"

Interface to calculation engine: DesignBuilder DSM

Interface to calculation engine version: v7.3.1

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

Certifier details

Name: Ciaran Dorrity

Telephone number: 02074860680

Address: 8-9 Stephen Mews, London, W1T 1AF

Foundation area [m²]: 193.38

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

Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	2	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	1.7	
Target primary energy rate (TPER), $kWh_{PE}/m^2.annum$	21.27	
Building primary energy rate (BPER), $kWh_{PE}/m^2.annum$	16.94	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

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

Fabric element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.26	0.26	Unit 3 L00 Office - Lift_W_3
Floors	0.18	0.18	0.18	Unit 3 L00 Office - Lift_E_0
Pitched roofs	0.16	0.16	0.16	Unit 3 L00 Office - Warehouse_R_2
Flat roofs	0.18	0.18	0.18	Unit 3 L01 - Circ 1_R_1
Windows** and roof windows	1.6	1.6	1.6	Unit 3 L00 Office - Entrance_G_5_1
Rooflights***	2.2	-	-	No Rooflights in project
Personnel doors^	1.6	1.6	1.6	Unit 3 L00 Office - Entrance_D_2
Vehicle access & similar large doors	1.3	1.3	1.3	Unit 3 L00 Office - Warehouse_D_0
High usage entrance doors	3	-	-	No external high usage entrance doors

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [W/(m²K)] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [W/(m²K)]

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [W/(m²K)]

* 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/m²K

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

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

Building services

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

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

1- Panel Heaters

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

2- Atlas Office VRF

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	4	6	-	1.4	0.85
Standard value	2.5*	N/A	N/A	2^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

1- Atlas DHW

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

Zone-level mechanical ventilation, exhaust, and terminal units

ID	**System type in the Approved Documents**
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	**SFP [W/(l/s)]**									**HR efficiency**	
ID of system type	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	**Zone**	**Standard**
Unit 3 L00 Office - Disabled WC + Shower	1-		0.3	-	-	-	-	-	-	-	N/A
Unit 3 L00 Office - Shower	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 3 L00 Office - WC 1	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 3 L00 Office - WC 2	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 3 L00 Office - WC	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 3 L01 - WC 1	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 3 L01 - WCs 2	-	-	0.3	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
Unit 2 L01 - WC 1	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 2 L01 - WC 2	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 2 L00 - WC 1	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 2 L00 - Disabled WC + Shower 1	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 2 L00 - WC 2	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 2 L00 - WC	-	-	0.3	-	-	-	-	-	-	-	N/A
Unit 2 L00 - Shower	-	-	0.3	-	-	-	-	-	-	-	N/A

Shell and core configuration

Zone	Assumed shell?
Unit 3 L00 Office - Lift	NO
Unit 3 L00 Office - Entrance	NO
Unit 3 L00 Office - Disabled WC + Shower 1	NO
Unit 3 L00 Office - Shower	NO
Unit 3 L00 Office - WC 1	NO
Unit 3 L00 Office - WC 2	NO
Unit 3 L00 Office - Circ 2	NO
Unit 3 L00 Office - WC	NO
Unit 3 L00 Office - Circ	NO
Unit 3 L00 Office - Cleaners	NO
Unit 3 L00 Office - Undercroft	NO
Unit 3 L01 - Circ 1	NO
Unit 3 L01 - Cleaners	NO
Unit 3 L01 - Circ 3	NO
Unit 3 L01 - WC 1	NO
Unit 3 L01 - Circ	NO
Unit 3 L01 - WCs 2	NO
Unit 3 L01 - Office	NO
Unit 3 L01 - Lift	NO
Unit 2 L01 - WC 1	NO
Unit 2 L01 - Circ 1	NO
Unit 2 L01 - Circ 2	NO
Unit 2 L01 - WC 2	NO
Unit 2 L01 - Lift	NO
Unit 2 L01 - Office	NO
Unit 2 L01 - Cleaners	NO
Unit 2 L01 - Circ	NO
Unit 2 L00 - WC 1	NO
Unit 2 L00 - Entrance	NO
Unit 2 L00 - Circ 2	NO
Unit 2 L00 - Disabled WC + Shower 1	NO
Unit 2 L00 - Lift	NO
Unit 2 L00 - WC 2	NO
Unit 2 L00 - WC	NO
Unit 2 L00 - Cleaners	NO

Shell and core configuration

Zone	Assumed shell?
Unit 2 L00 - Circ	NO
Unit 2 L00 - Shower	NO

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
Unit 3 L00 Office - Lift	110	-	-
Unit 3 L00 Office - Entrance	110	-	-
Unit 3 L00 Office - Disabled WC + Shower 1	110	-	-
Unit 3 L00 Office - Shower	110	-	-
Unit 3 L00 Office - WC 1	110	-	-
Unit 3 L00 Office - WC 2	110	-	-
Unit 3 L00 Office - Circ 2	110	-	-
Unit 3 L00 Office - WC	110	-	-
Unit 3 L00 Office - Circ	110	-	-
Unit 3 L00 Office - Cleaners	110	-	-
Unit 3 L00 Office - Undercroft	110	-	-
Unit 3 L01 - Circ 1	110	-	-
Unit 3 L01 - Cleaners	110	-	-
Unit 3 L01 - Circ 3	110	-	-
Unit 3 L01 - WC 1	110	-	-
Unit 3 L01 - Circ	110	-	-
Unit 3 L01 - WCs 2	110	-	-
Unit 3 L01 - Office	110	-	-
Unit 3 L01 - Lift	110	-	-
Unit 2 L01 - WC 1	110	-	-
Unit 2 L01 - Circ 1	110	-	-
Unit 2 L01 - Circ 2	110	-	-
Unit 2 L01 - WC 2	110	-	-
Unit 2 L01 - Lift	110	-	-
Unit 2 L01 - Office	110	-	-
Unit 2 L01 - Cleaners	110	-	-
Unit 2 L01 - Circ	110	-	-
Unit 2 L00 - WC 1	110	-	-
Unit 2 L00 - Entrance	110	-	-
Unit 2 L00 - Circ 2	110	-	-
Unit 2 L00 - Disabled WC + Shower 1	110	-	-
Unit 2 L00 - Lift	110	-	-
Unit 2 L00 - WC 2	110	-	-
Unit 2 L00 - WC	110	-	-
Unit 2 L00 - Cleaners	110	-	-
Unit 2 L00 - Circ	110	-	-
Unit 2 L00 - Shower	110	-	-

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

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Unit 3 L00 Office - Undercroft	NO (-1.4%)	NO
Unit 3 L01 - Office	YES (+12.3%)	NO
Unit 2 L01 - Office	NO (-31.1%)	NO

Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	NO
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	NO

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m^2]	4727.9	4727.9
External area [m^2]	13278.9	13278.9
Weather	MAN	MAN
Infiltration [m^3/hm^2@ 50Pa]	5	5
Average conductance [W/K]	3687.66	10315.7
Average U-value [W/m^2K]	0.28	0.78
Alpha value* [%]	25	10

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

Building Use

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

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

	Actual	Notional
Heating	6.65	3.99
Cooling	0.6	0.37
Auxiliary	0.78	1.33
Lighting	9.1	4.68
Hot water	6.26	6.26
Equipment*	30.52	30.52
TOTAL**	**23.4**	**16.62**

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

Energy Production by Technology [kWh/m^2]

	Actual	Notional
Photovoltaic systems	12.88	2.27
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*12.88*	*2.27*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	29.01	25.01
Primary energy [kWh_{PE}/m^2]	16.94	21.27
Total emissions [kg/m^2]	1.73	1.99

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] No Heating or Cooling										
	Actual	0	0	0	0	0.2	0	0	0	0
	Notional	0	0	0	0	0.3	0	0	----	----
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
	Actual	344	0	119.4	0	0	0.8	0	1	0
	Notional	312.4	0	64.8	0	0	1.34	0	----	----
[ST] Variable refrigerant flow, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	28.8	121.9	2.2	8.8	9.3	3.69	3.83	4	6
	Notional	65.3	52	6.9	5.3	15.1	2.64	2.7	----	----

Key to terms

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

Appendix III

GMCA Energy and Carbon Proforma

Energy and Carbon Proforma

Non-residential

Major development *(+1,000m²)*

Version 2.0

		Ref. name	*Atlas Business Park*
		Area (m²GIA)	*36866.3*
		Target values	**Units 1-7**
Minimise energy demand	**Space heating demand (kWh/m²GIA/yr)**	***≤ 15***	*106.3*
	Space cooling demand (kWh/m²GIA/yr)	***≤ 15***	*30.5*
	Calculation methodology used to calculate space heating demand and confirmation that this covers all homes/blocks	*Predictive energy model*	*DSM*
	Form factor per building	*≤ 2*	*2.87*
	Average external wall U-value (W/m²K)	*≤ 0.15*	*0.26*
	Average window U-value (W/m²K)	*≤ 1 (triple)*	*1.6*
	Air permeability rate (m³/h/m² @ 50 Pa)	*≤ 1*	*5*
Maximise energy efficiency	**BREEAM Ene 01 rating**	***Excellent***	***Excellent***
	Energy use intensity (kWh/m²GIA/yr)	-	*50.61*
	Calculation methodology used to calculate energy use intensity and confirmation	*Predictive energy model*	*DSM*

	that this covers all homes/blocks		
Use renewable energy	**PV footprint area (% of ground floor space)**	**-**	***17.9%***
	Annual renewable energy generation (kWh/m^2 building footprint/yr)	-	*28.07*
	Renewable energy balance (%)	-	*47.1%*
	Total energy used (kWh/yr)	-	*1,865,803*
	Total energy generated on-site (kWh/yr)	-	*878,155*
Use low carbon energy	**Fossil fuel free (yes/no)**	***Yes***	***Yes***
	Heating heat source	*Electric*	*Electric*
	Domestic Hot Water heat source	*Electric*	*Electric*
	Low Carbon Heat Appraisal completed	*Yes*	*Yes*
	Heat network suitability	-	*Low*
	Exemption requested	-	*NA*
	Efficiency of heating system (SCOP)	*≥ 3.5*	*4.0*
	Efficiency of domestic hot water system (SCOP)	*≥ 3.5*	*1*
	Carbon content of heat (gCO_2/kWh)	*≤ 100*	*TBC*
Reduce overheating risk	**Has CIBSE TM52 been used to calculate overheating and does the building pass?**	***Yes***	***No***
	What percentage of spaces are cooled? (% of GIA)	-	*7.75%*
	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 ($kgCO_2e/m^2GIA$)**	-	
	List top three materials with the highest upfront embodied carbon emissions ($kgCO_2e/m^2GIA$): Material 1	*133 $kgCO_2e/m^2$*	*Ready-mix Concrete*
	Material 2	*115 $kgCO_2e/m^2$*	*Structural Steel*
	Material 3	*77 $kgCO_2e/m^2$*	*External Sandwich Panel Cladding*
	Lifecycle embodied carbon ($kgCO_2e/m^2GIA$) - *for large major developments only*	*537 $kgCO_2e/m^2$*	*Preliminary Upfront carbon estimate (A1-A5) for sitewide impact including external works*
Offsets	**Offset contribution (£)**	**-**	***Nil***